AMERICAN CINEMATOGRAPHER

FOR AMATEUR AND PROFESSIONAL PHOTOGRAPHERS

November
1939
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American Society of
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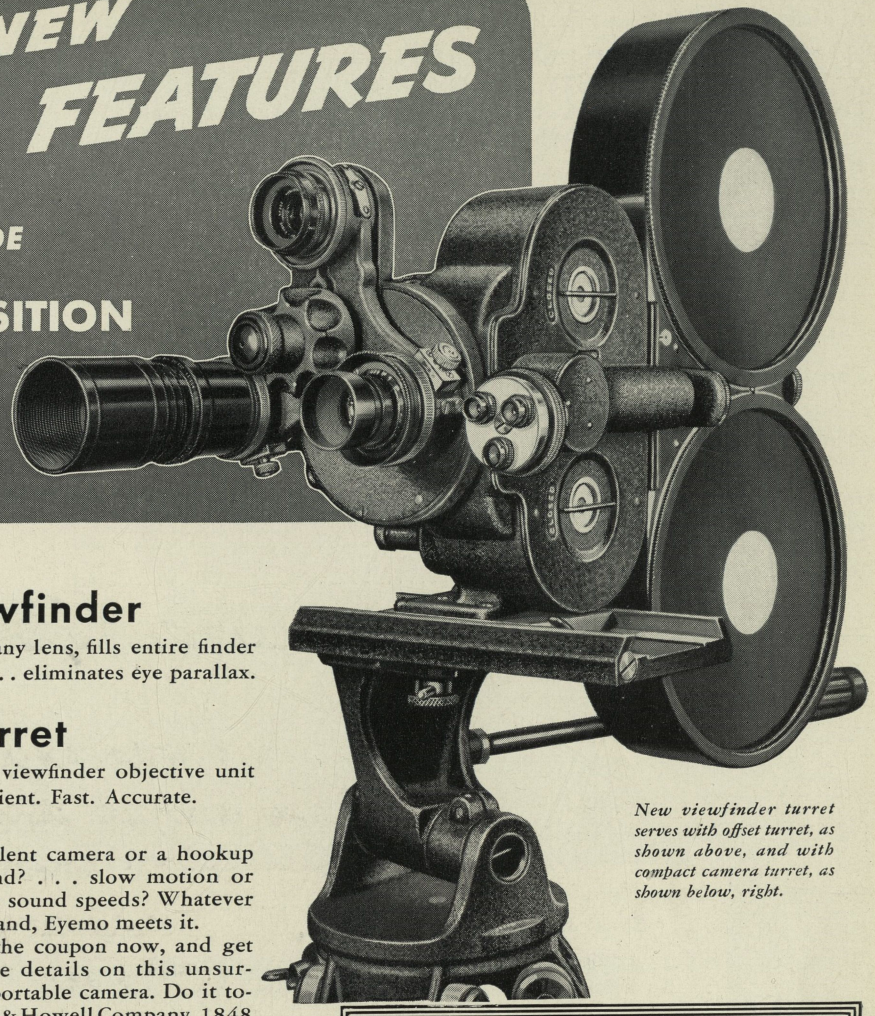

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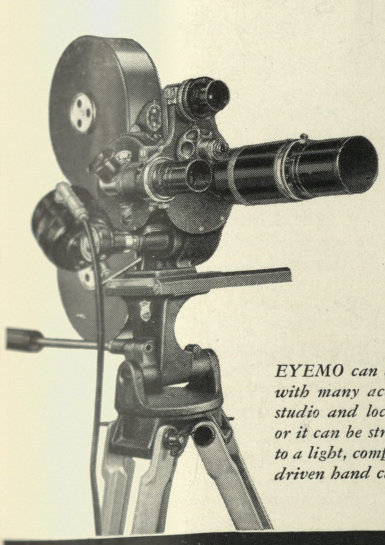

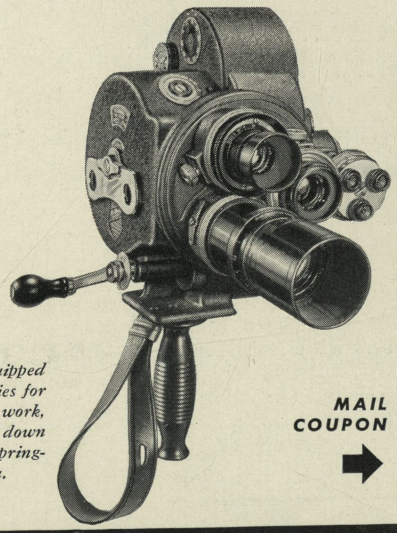

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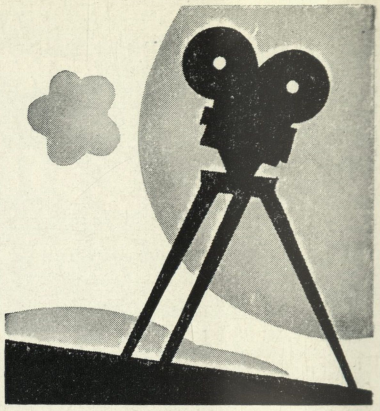

CONTENTS

Front Cover

THE big camera is rolling on a Paramount set, where Bing Crosby is costarring in "Road to Singapore," with Bob Hope and Dorothy Lamour. Bing is shown at the left. Others, left to right, are Director Victor Schertzinger, Don Gallaher (kneeling), dialogue director; Chief Cameraman William Mellor, A.S.C.; Neil Breckner, second cameraman, and Claire Bencke, script clerk.

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FINE GRAIN FILMS MAKE STRONG ADVANCE

By GEORGE BLAISDELL

ACCORDING to reports to the Society of Motion Picture Engineers, in Fall convention at New York, October 16 to 19, important discoveries in the realm of fine grain positive films have been made recently by Hollywood technicians.

One of the reports has been made by Dr. John G. Frayne of Erpi, chairman of the fine grain film committee composed of representatives of the Electrical Research Products Inc., and several of the Western Electric recording licensees, which has been functioning since February of the present year and signed by ten others representing those licensees on the one hand. Dr. Charles R. Daily of the Paramount Sound Department submitted the other.

Those composing Dr. Frayne's committee are L. A. Aicholtz of Universal, F. C. Albin of Goldwyn, G. M. Best of Warner Brothers, G. A. Chambers of Eastman Kodak, C. R. Daily of Paramount, John K. Hilliard of MGM, W. W. Lindsey of Selznick International, Hollis W. Moyse of Du Pont Film, Elmer Raguse of Hal Roach and S. J. Twining of Columbia.

It is worthy of note that while the objective of these searchers for improvement through the medium of fine grain films was in the interest of sound, nevertheless it has been found that as the new film reduces screen graininess, fuzziness, blur and background distortion to a minimum, also it provides for a warmth and richness not known before in films, affording more perfect image definition and a photographic effect described as the "luster of old ivory."

Improved Definition

The report of Dr. Frayne and his committee set forth that: "The improvements from the use of fine grain film in variable density recording are not confined to increased signal to noise ratio, but include other factors such as improved image definition which may be traced to reduced flare in the emulsion.

"This results in a cleanness of all high frequency tones not hitherto attainable, and is also accompanied by a moderate increase in the high frequency output in such films as compared to standard films. A very low degree of distortion is indicated, when measured by intermodulation or harmonic analysis, on fine grain prints made from fine grain negatives, especially if ultraviolet light is used in exposing the print stock.

"This low distortion undoubtedly is partially responsible for the pleasing quality of recordings made on fine grain films.

Better Light Sources

"To obtain satisfactory results with current fine grain stocks, dynamic methods are recommended for determination of optimum processing conditions, as misleading information may result from the application of classical sensitometry to these films. The use of these films under laboratory conditions generally calls for the exercise of greater care in processing and handling in order to avoid noise from dirt and abrasions.

"Such noise is more evident on these films due to lack of masking by the lower background noise inherent in these stocks. One of the chief problems presented with the use of these films has been that of being able to obtain sufficiently low negative gamma and at the same time obtain the required negative density.

"This has required a development of suitable negative baths. While the slow speed of these films may still be considered a problem, the improvements in light sources as well as in optics indicate that present fine grain stocks or future ones, even more slow, may be exposed without any great difficulty.

"In spite of the difficulties attendant to the introduction of fine grain film in the sound recording field, the improvement in signal to noise and in general quality mean their inevitable introduction on a wide scale into the motion picture industry."

Dr. Frayne in his report says in opening that the MGM studio, after a thorough investigation of various fine grain emulsions, has adopted the type 222 stock furnished by the DuPont Company for all original negative and print material, as well as for the re-recorded negative. Several pictures have been released, the report continues, in which fine grain film has been used in some of the processes leading up to the release print.

Tests at Goldwyn

"At the Samuel Goldwyn Studios considerable tests were carried out on various experimental emulsions offered by DuPont and by the Eastman Kodak Company, as well as on some of the standard fine grain emulsions offered by both of these suppliers," the report continues. "The re-recording tests made by this studio were confined to original negatives and re-recording prints of scoring, and some of this material has been utilized in pictures that have been already released.

"For some time all re-recording prints at Paramount have been made on the 222 stock from a normal sound negative and one complete picture has been re-recorded to fine grain release negative with a limited number of release movietone prints also being printed on the 222 stock. This represents the first complete adaptation of fine grain stocks to release.

"The Universal Studio made some scoring and dialogue tests on the 1365 stock furnished by the Eastman Company, with prints being made on the same material."

Dr. Frayne tells how Erpi has been active in a fundamental investigation of the sensitometric properties and the signal to noise relationships of all the available fine grain emulsions with a view to recommending them wherever possible in the variable density recording program.

Reference is made by Dr. Frayne to the fact that the high pressure mercury arc with a high intrinsic brilliance has

been found to be the most suitable source for use in printing these stocks. Several laboratories on the West Coast are completely equipped or are in process of being equipped with these light sources.

Dr. Daily's Conclusions

Dr. Charles R. Daily of the Paramount Sound Department, who made a report to the engineers and who also has made an exclusive report to the American Cinematographer, in his conclusions to the convention makes the following significant statement:

"The commercial application of fine grain stocks for release sound and picture printing, for release sound negative and for dubbing prints has effected:

"A material improvement in picture detail and sound quality. The volume range has been materially increased and the disturbing effects of modulated film noise reduced."

The production which Paramount first introduced to its new stock, or rather the stock on which it had imprinted the results of its experiments, was "Geronimo!" This was DuPont 222. On this there has been made a sufficient number of prints to supply the key cities.

During the final third of the month of October the order was put into effect at Paramount to use the fine grain positive prints on the "Victor Herbert" production. This is believed will be a stronger picture than the first one selected by reason of the great amount of music in it, a better opportunity for the fine grain positive to show the stuff it is made of.

Lab and Sound Together

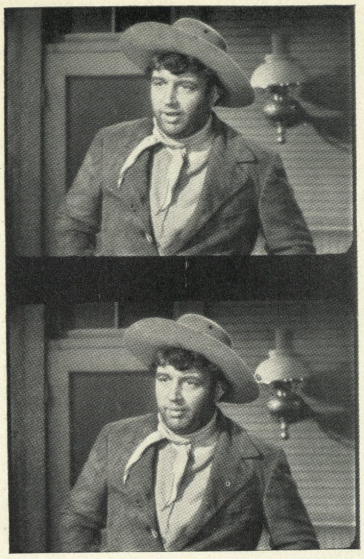
At the Paramount studio Chief Wilkinson of the laboratory department had had "something on his chest" for a long time. He worked on indefinite specifications until they became definite, at which time he called in the sound department. The latter department went to it with a will. More than that, the head of the department delegated Doctor Charles Daily, optical and light technician in the sound section, to work with the laboratory.

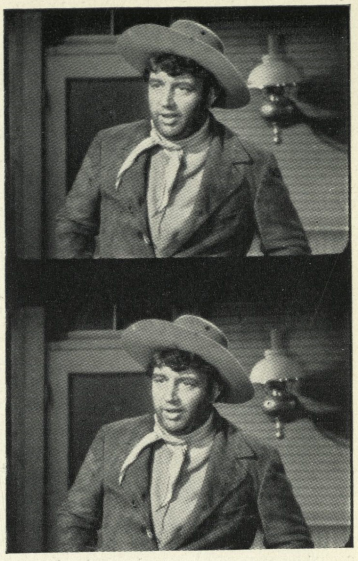
Doctor Daily made the air-cooled lamp while the sound department worked on getting sufficient exposure. The laboratory worked out low contrast developers which would bring the gamma down to the necessary levels.

The combination of sound and laboratory effort on exposing and developing test material resulted in determination of proper gammas and densities. The laboratory worked out exposure and development technique for making dubbing and release prints.

The camera department welcomes the changes that have resulted from the double play that went on from laboratory to sound to DuPont. It was Henry Sharp, A.S.C., to whom fell the pleasurable duty of putting the picture on negative.

"I don't think there is any doubt the cameramen will welcome the new film," declared Roy Hunter, head of the camera department. "Heretofore we have had many improvements on the negative side, but the positive was not so fortunate. In fact, I have heard it said in the department that things could be done with the negative which could not be accomplished with the postive—that much better definition rode in the negative than could be replanted in the positive."





Left, enlargement of motion picture frame on positive formerly used.

Right, enlargement of print made on fine grain positive.

Same negative used in each case.

Positive Matches Negative

Speaking of the new positive fine grain film Loren Ryder said that great strides have been made in recent years in supersensitive negative. "But the full value of these negatives was never realized," he went on, "because a matching positive film stock had not been perfected. Now we have the positive fine grain film, and it has been engineered so as to take full advantage of all the attributes of the fine grain negative.

"In the past approximately 60 percent of the perfection of the fine grain negative film—utilized so far only in actually photographing a movie—was lost in placing the images on old type positive film. Theatre audiences see the positive. Under the new system, utilizing the fine grain positive film and process for its development, theatre patrons see exactly what the camera on the set sees—and hears."

The reporter suggested that while it seemed to him the technicians believed the larger success of the new development was on the side of the sound, nevertheless it was his belief the opinion of the great public would be the photographic angle was the more important.

Minimizes Glare

The sound department head smiled. "The physics of sound and light follow the same laws of science and nature," he said. "In many respects the things which interfere with one interfere with the other as applied to motion pictures. It is possible, of course, that the public is more interested in photography than it is in sound, that it has been trained in one and not in the other, and to that extent it may be quicker to detect the advance in photography.

"This new film of finer grain structure and greater resolving power gives a higher degree of clearness of vision and hearing. Pictorially it creates the same effect on the vision as the wearing of a pair of dark glasses on a brilliantly sunlit spot. It gives brilliance, but minimizes the glare.

"As to sound it is clearer than ever before from harshness, from disturbing scratchiness. The voices of the actors speak with soft mellowness from the screen and all accompanying mechanical noises are silent. If the audience no longer be conscious of the reproduced sounds then the advance is distinctly on the side of nature, of naturalness, of illusion. If this prove to be really true then in fact we may be approaching the staging of an ideal motion picture story.

"The new film has the power of giving greater clarity which if it were there by itself would make objects appear hard and sharp and unpleasant, or overcontrasty as defined by the photographer; but the molecular arrangement of the silver granules is so established as to effect a softening of the picture to the proper balance of contrast.

"Never before have the two phenomena been understood and utilized to the degree that exists in this new film.

"In 'Geronimo!' is the forerunner of a change which is bound to bring about a complete revision of all positive films used. The change in printing involves the use of the ultra-violet mercury light, not previously used for printing positive.

"RCA for some time has taken advantage of some of the improvements available from ultra-violet light in its high-fidelity recording. The engineering of this process starts in where RCA left off—and utilized it for a newly evolved fine grain film for picture as well as sound.

"A mercury light is used in this process so as to obtain great rays of light further into the ultra-violet spectrum

than ever has been used heretofore in making sound motion pictures."

Statement of Chief Wilkinson

"From a pictorial standpoint," said James R. Wilkinson, chief of the Paramount Laboratory, "when we speak of a fine grain print, most of us still visualize a quality somewhat similar to the fine grain master positives that are now in general use—low in contrast, with great smoothness and splendid reproduction of detail, but entirely lacking in screen brilliance and rich shadow densities that make for satisfactory visual quality.

"To obtain the desired brilliance and retain the benefits of fine grain it was necessary to go to a stock with inherently higher contrast. An extensive study of print exposure, gamma characteristics and development methods resulted in satisfactory screen quality. The specifications were noted and the plus and minus tolerances defined.

"These established specifications constituted, for the sound group, a definite and predetermined end point fixed by picture requirements.

"It was necessary to work in reverse, backward through the various steps in processing and exposure, to establish the proper sound specifications. This task was undertaken by Dr. Charles Daily in collaboration with the laboratory sensitometric group.

"Numerous tests were processed and measured, frequency characteristics were analyzed, dynamic measurements made, distortion charted and optimum exposure and processing specifications were defined.

"The final gamma was 2.50, as compared with the normal black and white gamma of 2.15."

Moyse on Fine Grain

In an effort further to clarify the work that is taking place in the field of fine grain film, the writer called on Hollis W. Moyse of the DuPont Company. Mr. Moyse, who has been active in fine grain matters, was asked if he would give a brief outline of the steps being taken by those in the industry most interested in fine grain films.

"Why, yes, I'll try," he said. "Efforts to reduce the surface or ground noise in sound-on-film work have occupied the attention of sound engineers for a number of years. The noise originates from the dirt and abrasions which the film picks up in the course of its processing and handling and from the granularity of the silver deposit which makes up the image.

"The first efforts to reduce the effect of such factors were along electrical lines. Light valves were biased electrically so that the average amount of light reaching the negative increased with signal strength.

"With this system, when there is no signal the full effect of the noise reduction applies and the negative has little density. This results in a dark print which projects quietly, since the electrical output to the speakers decreases as the prints get darker. As the signal strength from the microphones increases the average illumination reaching the negative increases and the resulting print becomes lighter and lighter.

"This permits more and more of the undesirable noise to be heard. At full modulation of the light valve there is the same noise output as though no electrical ground noise reduction has been applied.

Definite Limitations

"This variation of background noise with signal strength causes a disturbing effect which is readily recognized. In addition, the noise intermodulates with the signal and detracts from its cleanness and naturalness. Thus, there are definite limitations to the benefits which can be derived from the present electrical methods of eliminating noise.

"The other approach to reduction of noise, obviously, is to take it out of the film itself. That arising from dirt and abrasions has been reduced to a very low level by careful processing and handling in every stage of the film's use.

"That coming from the granularity of the silver image has not been open to attack until recently, although it has been recognized for some time as a source of considerable importance.

"The restriction on exposure was lifted, partially at least, by the recently developed high intensity mercury arc. With its advent, fine grained films, designed for sound purposes, were made available to the trade.

Photographic Results

"The first noise measurements made on the new type of film indicated a substantial reduction in ground noise, and the listening tests indicated an even greater improvement.

"The advantage over the conventional recording materials was so marked that no time was lost in getting the film into production use for original negatives and dubbing prints. The benefits in the final product from the use of the fine grained stock in the first two of the four sound steps were very appreciable.

"The application of the new type of film has now been carried through the four steps, so that its full benefit is brought to the theater audience.

"In addition to the obvious improvement in sound quality, the use of fine grained film as a release positive has resulted in a substantial improvement in the picture quality. The decrease in graininess of the picture results in a smoothness of texture that is most pleasing, and the general photographic quality is definitely enhanced."

Berndt-Maurer Sync Motor Announced for Cine Special

A new synchronous motor driving unit for the Cine-Kodak Special is announced this month by the Berndt-Maurer Corporation of New York. With it the camera is held to an unvarying 24-frames a second—the standard sound-recording speed—so that the resulting picture is suited to use with sound-on-film recorded music or narration.

Coupled with this is a recording service with studios in New York, Kansas City and Pasadena, where musical or descriptive sound tracks may be dubbed on to the film.

The new motor unit comprises a special sub-base interposed between the camera and the tripod, and which carries the motor and camera in rigid alignment. A special coupling joins the motor to the camera's driving shaft.

The camera is mounted on this unit by means of a conventional tripod screw, and may be instantly removed for ordinary use. Prices for the recording service are said to compare favorably with the costs of first-class professional titling for silent pictures.

John W. Boyle, A.S.C., Tells of Safe Arrival in Bagdad

Leaving Bagdad on September 18 and reaching Hollywood in a month and a couple of days is word from former President John W. Boyle, A.S.C., who after many months gets a message across to his society. John left New York June 21 as a member of the Trans-Asia expedition with an itinerary that included Paris, through France, Germany, Austria, Czechoslovakia, Roumania, Turkey, and now Bagdad. He had just completed a 500-mile run across the Syrian desert.

From Bagdad it was planned to take in Iran, Afghanistan, India, including the Himalayas, and thence to Bombay, from which point return would be made.

The expedition, which was described in the August issue of this magazine, consists of a specially built trailer designed by General Motors at a cost of $80,000 and two Chevrolet trucks. There is a two way short wave radio that can sustain conversation for eighty miles. There's a Buick sedan with a special trailer. And there's a crew of six men.

An extensive picturemaking schedule is to be covered by the party, at the head of which is Lawrence C. Thaw, who is aided by his wife. There are cameras to burn. In the lot are two Mitchells, for black and white and bipack, as well as an Akeley and two Eyemos. Then there are four Contax and two Graflex, and at least a half dozen meters, Weston and G. E.

The writer of the message makes a special request that the United States be kept out of the war until he gets back. Maybe that's not a modest request. The writer sends his best wishes in any event.

Willoughby's Printer Sale

Willoughby's, at 110 West Thirty-second street, New York, is conducting a sale on the Willo Miniature Printer and the Willo Metal Printer, $3.95 and $4.95 respectively. Then there is the new Law Photo Print Dryer, described as an efficient apparatus for those who demand flat and dry prints in a hurry.

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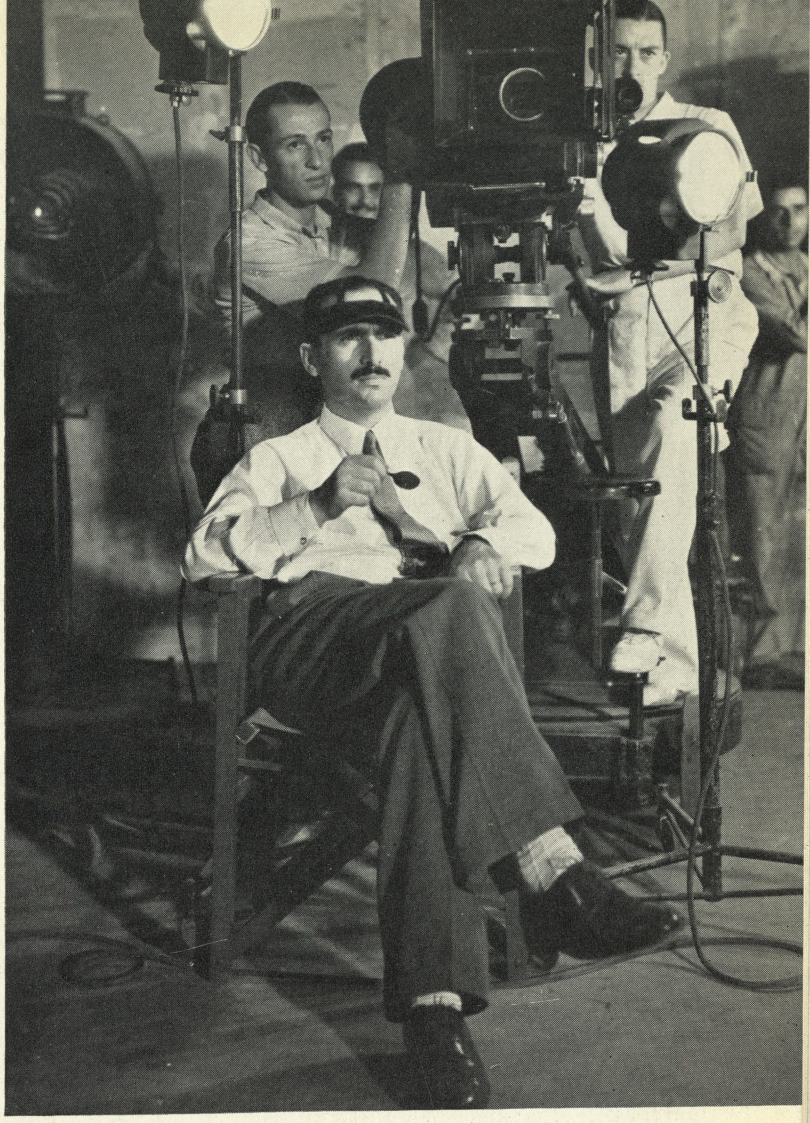
John Alton Returns to Hollywood from Abroad



John Alton, seated in chair following action in "El Matrero," recently highly successful Sono Film of Argentina.

JOHN ALTON, A. S. C., is back in Hollywood, and real glad he is. He's been going away and sooner or later coming home for twelve years. He has made pictures in Germany; in England and in France; in Africa; in Istanbul; in Berlin; in Paris; in the Argentine; then to the United States for a while, and then again to the Argentine, where he intended making one picture and remained to make six.

All of this traveling, hither and yon, has meant considerable languaging, so to speak. Besides English he has acquired principally French in France, German in Germany, and Spanish from pretty much all over—in the Americas from the Rio Grande to Patagonia. Then there are other languages which he does not pretend to handle real fluently.

In his last away from home assignment he went to the Sono Film Company in Buenos Aires, the biggest film company in the Republic, and remained a year and a half.

The next to the last picture was "El Matrero," a free translation of which would be "The Bad Man" or taking into account the distant location on which the exteriors were shot, "The Bad Man of Tucoman." The picture was a sensational success. The dailies raved about it, giving especial credit to the photography. In our recent September issue we told how Alton had been credited by Orestes Caviglia, director of the picture, in an interview:

Selected for Italy

"I have had several coworkers in the making of the picture. Especially must I mention for his intrinsic merits John Alton, who has aided me with his ample culture in writing the scenario and for his experienced contribution in the filming of the picture."

The Instituto Cinematografico selected "El Matrero" to be sent to the Venetian Motion Picture Exhibition as an authentic document on gaucho life.

It was in 1927 that Alton started on his wandering when he was sent to Heidelberg with Ernst Lubitch and Cameraman Al Lane to make stock shots for "Old Heidelberg."

Eastman some while prior to this had introduced Panchromatic in the American studios, but until the photographing of "Old Heidelberg" the stock had not been used in Germany. Arrangements were made with the UFA Studio to have the advantages of its laboratory for the development of Panchromatic.

At a special luncheon at the UFA Studio Alton talked about the new Panchromatic stock to the studio's photographic staff, describing its advantages and how it meant a real step ahead in the photographic field.

It may be said here that Alton had had experience in laboratory work before taking up camera work, a routine which some of the more successful cameramen before and since have likewise followed.

After he had returned to the States he was sent to Switzerland by Joe Cohn of MGM to film the Olympics for background shots for a Garbo Picture. That was in 1928. In Switzerland word was cabled to him to report to the late George Hill, former cameraman and now director, as operative cameraman, in Paris. There was work to be done on a foreign legion picture in Algiers and Morocco. Percy Hilburn and Harold J. Marzorati, A. S. C., were along on that trip.

There was work in England and France with Al Lane getting stock shots for a Jackie Coogan picture.

Then Sascha of Vienna called him for one picture. This was followed by several shorts for the Paramount office in Berlin. Curtis Melnitz, president of Berlin Carra United Artists, sent him at the head of an expedition to Istanboul,

or Constantinople, as might be more familiar, and Asia Minor. There were exteriors to be photographed of a super called "The Man Who Killed," by Claude Ferraire of Paris.

Goes to Joinville

Then he took a chief cameraman's place with Robert Kane at the Joinville or Paris studio of Paramount shooting versions in different languages.

In 1932 the director of the Buenos Aires opera met John Alton in Paris. There were talks regarding the motion picture, its background, its present, and its unlimited future. There was no studio in Argentina, and its chief city, Buenos Aires, would rate third in population if in the United States. That's how big it is.

The director did some fast thinking.

Alton was the first cameraman in Buenos Aires. He it was who installed in that city the first motion picture studio in the city and country. It was the Lumiton, which continues one of the most prominent today. Alton installed and built lights and laboratory.

It was late in 1932 when Lumiton made its first talking picture, "Los Tres Berretines." It may be worth noting that during the last year Alton dropped into a small theatre in the country, or outside the city's range, and ran smack into "Los Tres Berretines," the same picture that had been produced under plenty of handicaps in 1932. But really its survival gave him a kick at that.

Because of the financial success of Lumiton Alton was called to install another studio, the Argentina Sono Film, now standing as the No. 1 production unit south of the Rio Grande.

Buenos Aires has over two hundred sound theatres, which with its population of two and a half million is not at all crowded. Several of the pictures made in that country went out under the photographic imprint of Alton. During his work in Argentina he has photographed twenty-five feature length productions as well as co-directed, co-produced and written continuity on others.

Asked as to the length of his stay in the country this time he replied:

"My relations with my last employer in Argentina are most cordial. In fact, I am commissioned to do some equipment buying for the company in this country, and am executing that commission. But the United States looks good to me. Here is where I aim to be."

Regard for Customs

"What is the prospect for American pictures in South America?" was asked.

"That is a question," was the answer. "If the United States is to regain its old foothold on this market more pictures should be made with South American backgrounds and with full regard for South American manners and customs.

"You know how it is in any audience. Just one slip, a slip that ordinarily would be passed by foreigners, will be howled at in the land of its supposed nativity. In one picture a scene which caused unending ridicule was that wherein a policeman in swell Parisian cop's uniform walked the streets of Buenos Aires.

"It is not an uncommon thing for an American picture to portray its leading man leaving for his coffee plantation in the Argentine. The fact that aside from the Buenos Aires Botanical Gardens there is no coffee grown in the country accounts for the laughs that followed when shown in B. A.

"As I said, B. A. is a city of practically two and a half million persons. The city has five subway lines and others in construction. It has two of the most modern racetracks and one of the finest seaports.

"Argentina has its own motion picture industry, claiming some modern studios and laboratories. The industry has grown from one picture in 1932 to between sixty and eighty in 1940, depending on the importation of rawstock film and chemicals.

"The average Argentinan is even more of a picture-goer than is his nothern brother in the States. And don't forget that Argentine women are of the best dressed in the world, and their men are not far behind them. Failure to recognize this fact has been responsible for the failure of more than one picture.

"It is a situation that can be remedied. It is not sufficient that a picture be spoken in Spanish. If the picture is not to the taste of the audience or to its mentality it fails just as does an American picture at home. Many dramatic situations have been ruined because the characters talked in different dialects, resulting in great hilarity.

"A picture is made by attention to a multiplicity of little things—or it is correspondingly marred. When dealing in a medium other than your own the little things will multiply. That is inescapable."

UNLIKE 1914 KODAK NOW GETS SUPPLIES AT HOME

THE Eastman Kodak Company's manufacturing operations in Rochester are not endangered by any shortage of materials on account of the war.

Information posted on bulletin boards in the Eastman plants and office in that city showed that important materials which came largely from Europe in 1914 are now produced in the United States.

"When war broke out in 1914," the bulletin for employees explained, "the company had to make frantic efforts to accumulate materials from abroad to sustain our manufacturing operations in Rochester. At that time, adequate supplies of the following important materials were available only by importation from Europe: Paper to be sensitized, mostly from Germany; gelatin, mostly from Germany; sensitizing dyes for emulsions, from Germany; blanc fixe for surfacing paper, mostly from Germany; glass for plates, from Belgium and England; glass for lenses, mostly from Germany; certain developing agents, mostly from Germany; synthetic organic chemicals, from Germany.

Persons working in departments where these materials are used will realize how serious any lack of them would be.

"The war in 1939 finds that situation completely changed: Kodak Park now makes all of its own paper for sensitizing. The gelatin we use in Rochester is now entirely supplied by Kodak Park and the Eastman Gelatine Corporation, Peabody, Mass. The Kodak Research Laboratories now make the sensitizing dyes we need.

Blanc fixe is now made at Kodak Park entirely from American materials. Film has very largely superseded glass since 1914 for X-ray, portrait and commercial photography, but all the glass needed can now be obtained domestically. Increasing amounts of glass for lenses are being made in the United States and we have on hand a good stock of such foreign optical glass as we do require.

Our requirements for photographic developing agents are now supplied entirely by Kodak Park and the Tennessee Eastman Corporation. Kodak Park produces any synthetic organic chemicals we need and also sells organic chemicals to universities and other laboratories.

"Therefore,—the management is able to inform the employees that our Rochester operations are not endangered by any shortage of materials that can be foreseen as a result of the war."

New Books

16mm. Sound Recording for the Amateur. By Carroll A. Nye, Jr., and Samuel T. Golow. Fomo Publishing Company, Canton, Ohio. 58 pp. 13 sketches. $1.50.

Perhaps the best description of this book is to quote the foreword from A. Shapiro, chief engineer of the Ampro Corporation. Mr. Shapiro says:

"The authors of this valuable treatise have succeeded admirably in clarifying what is generally regarded as an abstruse subject so that the amateur, without professional training, can readily grasp both the principles and operation involved in sound pictures.

"Through the use of simple language and easily understandable drawings, the theory and practice of sound pictures are set forth so that any amateur can easily understand the ideas and put them into practice. This treatise should do much to popularize active participation in sound recording and reproduction by the amateur."

Making Modern Matte-Shots

By Byron Haskin,
A.S.C.

Head of Department of Special Effects
Warner Brothers-First National Studios

In Two Articles

ARTICLE I

NO branch of modern special-effects cinematography has received less attention of late in technical discussions than the matte-shot.

While it is perhaps only natural that such relatively newer and more spectacular techniques as the projected-background process and the use of the optical printer should monopolize the discussional spotlight to some extent, the matte-shot has an important place in modern special effects camerawork.

It contributes importantly to today's task of minimizing production costs while at the same time enhancing production values.

The modern matte-shot is an outgrowth of the old time "glass shot." In this, it will be remembered, a large pane of glass was suspended several feet in front of the camera. On it was painted whatever additions of structure or background might be desired to complete the scene, with clear areas through which the actual action might be photographed.

The painting and the actual set were carefully aligned and blended into each other, so that the result was a composite scene combining painted images with actual scenes and live action. From the purely photographic viewpoint this system worked excellently. But from the practical viewpoint, it had two serious disadvantages. It delayed production, and it restricted the technical and artistic freedom of both the director and the cinematographer.

Faster and Better

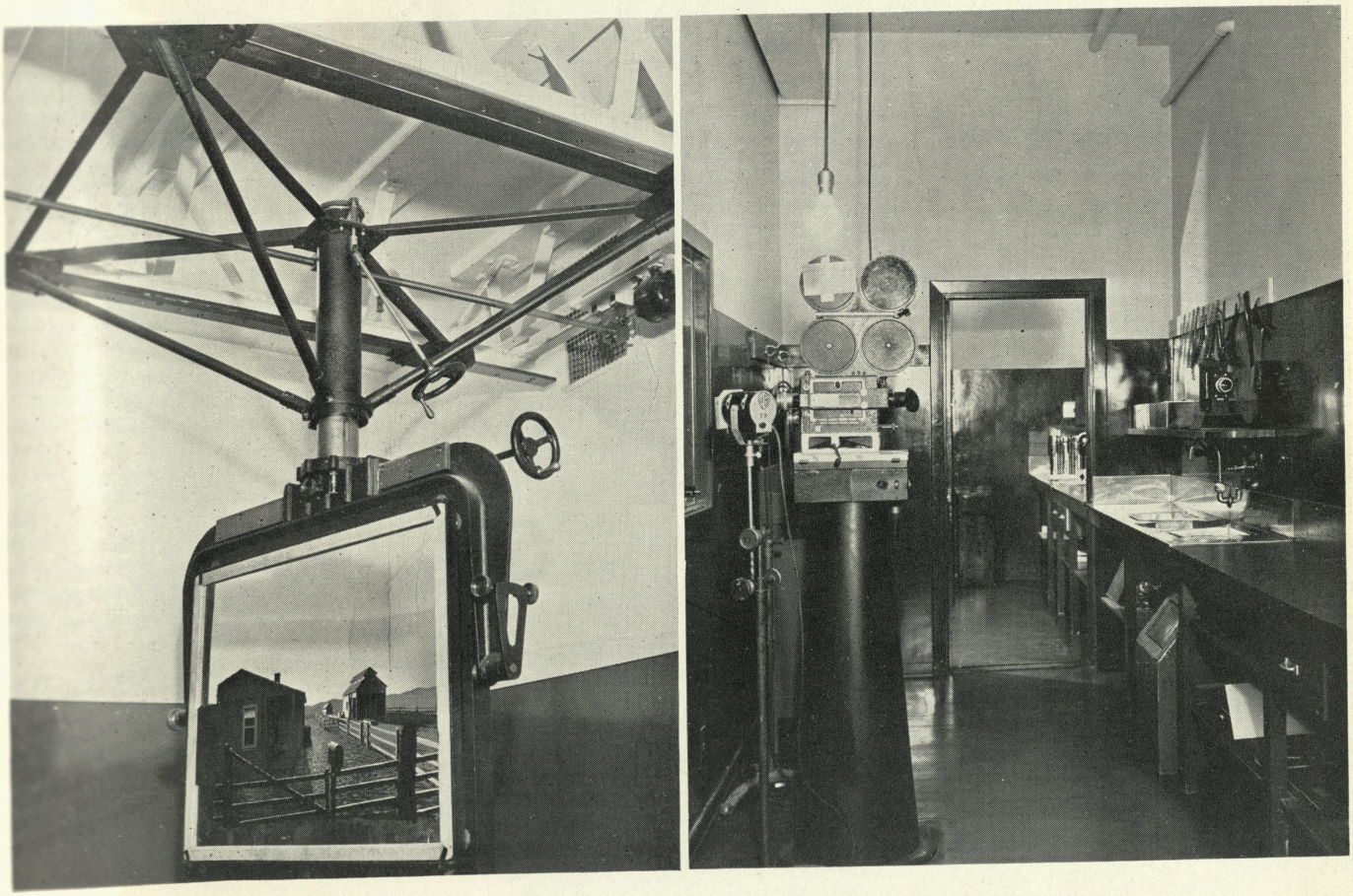
No matter how expert were your glass-shot technicians, time was involved in making the painting and aligning it with camera and set. Once aligned, the position of the camera could not be changed without necessitating changes in the painting, or even an entirely new painting.

To offset these practical drawbacks, the glass-shot evolved into the matte-shot. Instead of photographing both elements of the shot at once, each is now photographed separately, with complementary areas matted out. Both elements are photographed directly on the same negative film, though in separate exposures.

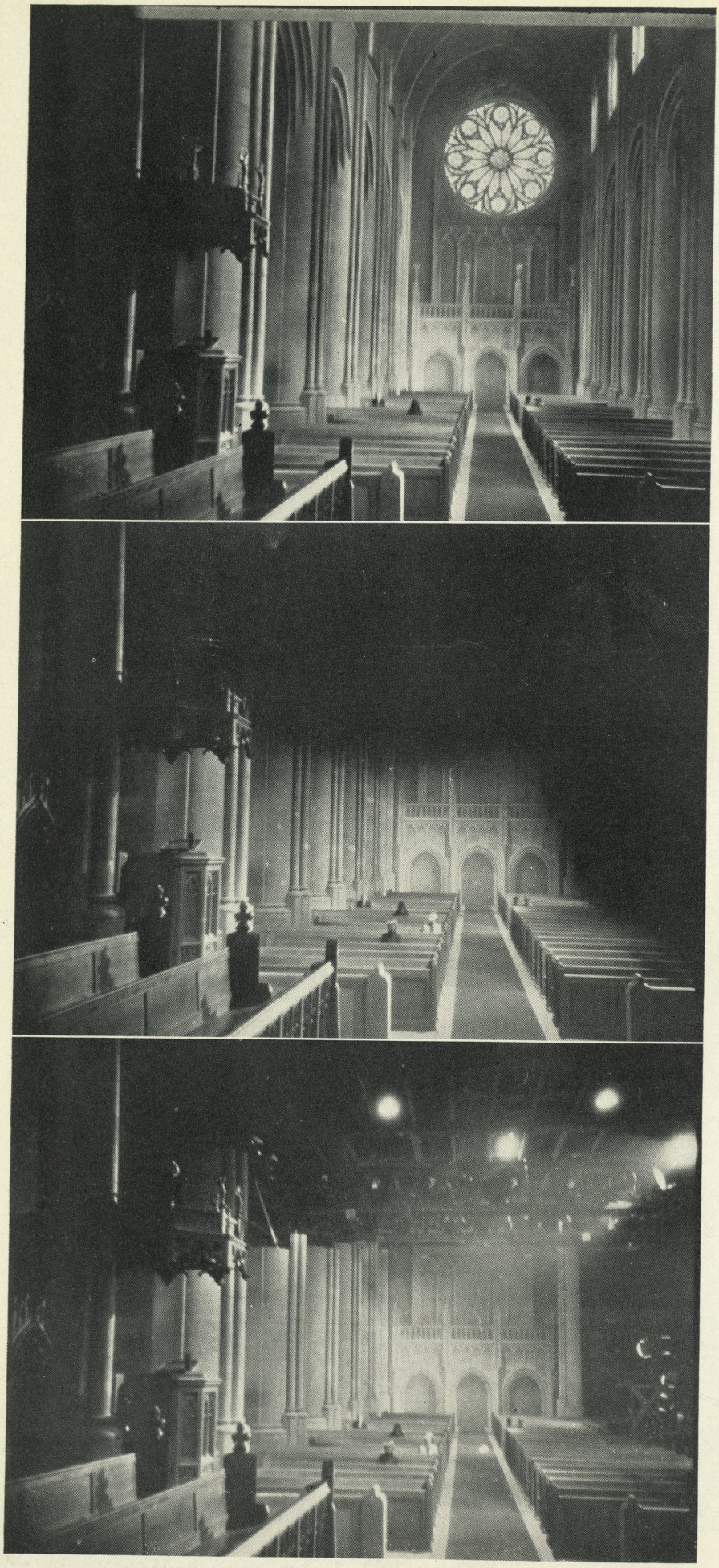
This virtually eliminates the difficulties referred to. It allows the live action—which involves the heaviest overhead—to be photographed more quickly, and with almost completely normal freedom as to camera-angles, since the complementary matte-paintings are made to fit the scene as actually shot, rather than to some rigid, prearranged plan.

Since the matte-paintings are both made and photographed separately, both the painter and the cameraman can do their work with greater precision, since they are not working under the pressure of delaying production on the set. The result is better, more convincing shots on the screen, and a wider application of the process.

As a rule, the need for a matte-shot



Left, mounting for matte paintings. Movable, by remote control, in any direction. Right, combined camera and test-developing room. Note rigid camera mount (left) and sink for developing test negative (right).



Evolution of a matte-shot. Bottom, actual construction on the set. Center, frame enlargement from test negative, showing mattes portion. Top, completed matte-shot combining actual set and painted right wall and ceiling.

becomes evident in the early, interdepartmental conferences on the script. Certain scenes—as, for instance, interior long-shots in which a ceiling is needed to complete the impression of a set—obviously call for matte-shots.

Others, it will be found, could possibly be accomplished by conventional means, but can be achieved more convincingly or more economically by use of the matte-shot technique.

Minimize Set-Construction

Once this method has been determined upon, all concerned coordinate their plans on the basis of making a matte-shot. Actual set construction, for instance, is held to the minimum necessary to permit free movement of the players; the rest is left to the matte painter.

Sometimes this actual construction is extremely little; in one production, the script of which called for a scene showing a flag flying from a castle tower, all that was actually built was the flagpole and flag. The tower and its background were provided by the matte painting!

When the actual shot is made, a member of the special-effects staff is on the set to see to the matting. Since a soft blend is usually preferable, the matte is placed relatively close to the lens, to produce this effect.

The camera is of course rigidly tied down, to eliminate any possibility of movement, and moving-camera shots are impractical.

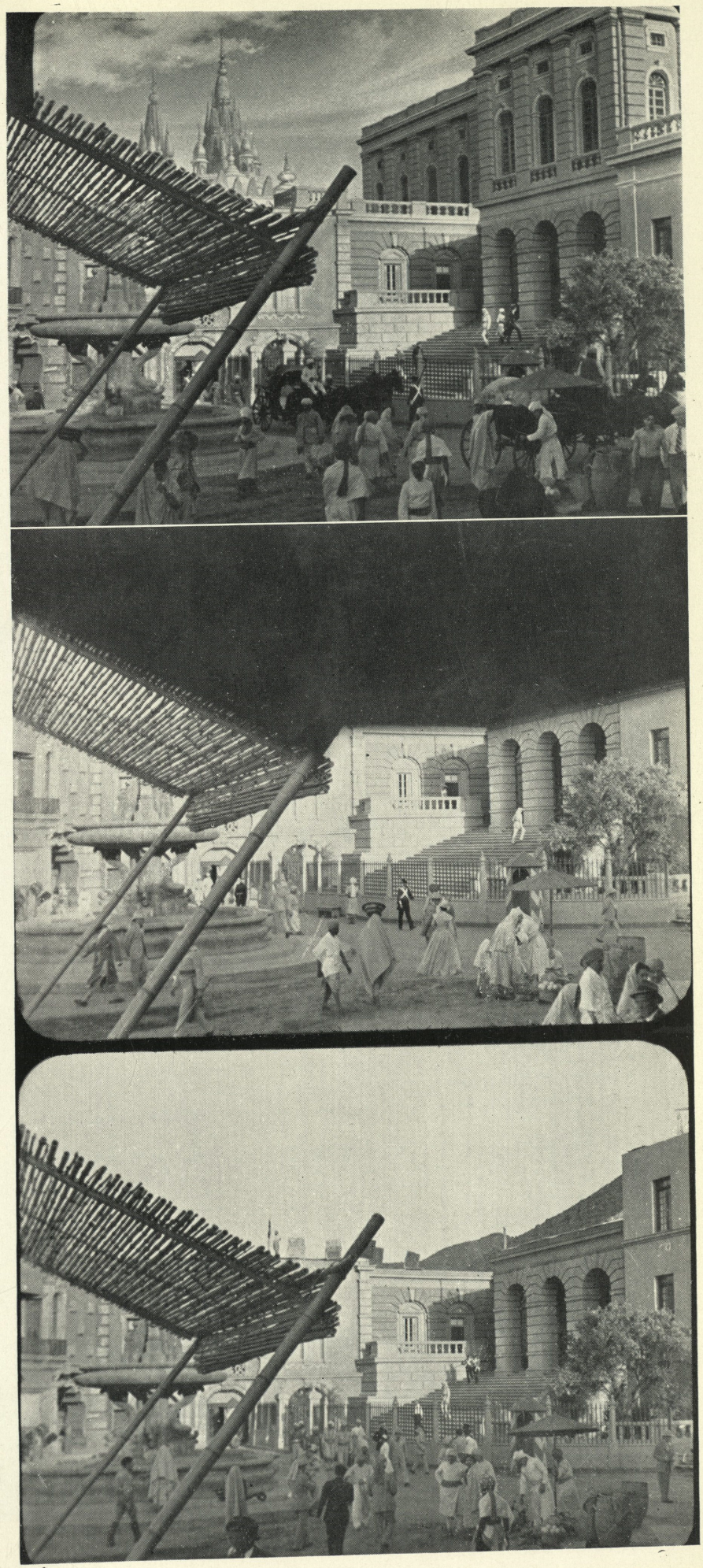
Since, however, the painting which is to complete the scene is not only photographed but actually painted *after* the action is photographed, both the director and the director of photography enjoy reasonable freedom in choosing and changing their camera angles as may be best for action or composition.

This means that on the set there is but a minimum of delay for making and adjusting the matte, tieing down the camera and exposing the vitally necessary test footage which guides the making and photographing of the matte painting. From one hundred and fifty to two hundred and fifty feet of test footage is exposed for most matte-shots.

When the action has been photographed, the negative is sent, undeveloped, to the special effects department, where it is held until needed.

Test Enlargements Guide

Then a short length of the test footage is developed, and a still enlargement is made, to guide the matte artist in making his painting. To minimize the misleading effects of negative graininess, we at Warner Brothers' usually make this enlargement not from one,



Bottom, set as actually built. Center, test negative showing matte-line. Top, the completed matte-shot.

but from several frames of film, so that the individual grain images tend to overlap and eliminate the effect of grain.

At times a dozen or more frames may be used to produce a single enlargement. This technique, of course, would be worthless if motion were involved; but fortunately the matte-painter need concern himself only with tonal values and form.

But in gaining this effect of minimized grain, definition is necessarily sacrificed to some extent. Projection of the test negative and inspection through a moviola and other magnifying devices help to offset this: but increased definition in the enlarged positive would be a definite asset.

There are a number of different methods of assuring accurate coordination between the original shot and the matte painting. Paul Detlefsen, who has been doing the matte-paintings for our department at Warner Brothers' for a number of years, uses a special still projector by which a frame of the test negative may be projected directly upon the matte-card in his easel.

Using this projected negative image as a guide, he proceeds to lay out his painting. It gives him an accurate guide as to alignment, detail and physical form; the enlarged multi-frame positive furnishes a guide to tonal values.

There is naturally a very delicate balance to be struck in making a matte painting: for the best effect, neither too much detail nor too little should be used, and since no two matte-shots present identical problems, this is a matter which can be guided only by experience.

Special Camera Set-Up

For photographing the paintings, we have a special camera installation. Since the critical factor is absolute alignment of the two components of the composite shot, which can best be determined by photographic tests, test-developing darkrooms are integral parts of the installation.

Each of our cameras is mounted on a rigid, concrete foundation-pillar, at the top of which is fitted a fixed head adapting it to the type of camera in use. This pedestal is inclosed in a generously proportioned booth which is equipped with complete darkroom facilities. The camera is trained on the painting through an unglazed window which may be closed—completely light-tight—by a sliding port.

Thus a test can be photographed, the exposed footage removed from the magazine without disturbing the camera, and the film developed for inspection with a minimum of trouble and delay.

This is important, for perfect re-

(Continued on Page 526)

Pacific Laboratories Announce Complete 16mm. Service

THE manufacturers of this country have recognized the tremendous advertising value of industrial motion pictures, and large companies such as United States Steel, General Motors, Caterpillar Tractor, Standard Oil, and many others with similar financial backgrounds have produced pictures costing $100,000 and more.

To place this wonderful advertising medium within the reach of companies with smaller budgets, methods had to be found to cut production costs. Smaller producing companies entered the field and pictures ranging in price from two to five thousand dollars were produced on 16mm. film.

With the advent of the talking motion pictures, complications arose for the 16mm. producer. Equipment for sound recording, sound projectors and many other instruments were not available in this size. Equipment manufacturers realizing the possibilities in the 16mm. field set to work and today sound recorders, sound cameras, and every other known device is manufactured to fit this size film.

Film manufacturers who furnish the motion picture industry with special emulsion film for general studio work, for difficult shots, for background and general exterior, supply this same film today in the 16mm. size.

To produce a professional picture using these different types of sensitive film the photographer must have the cooperation of a laboratory where definite standards of processing can be obtained.

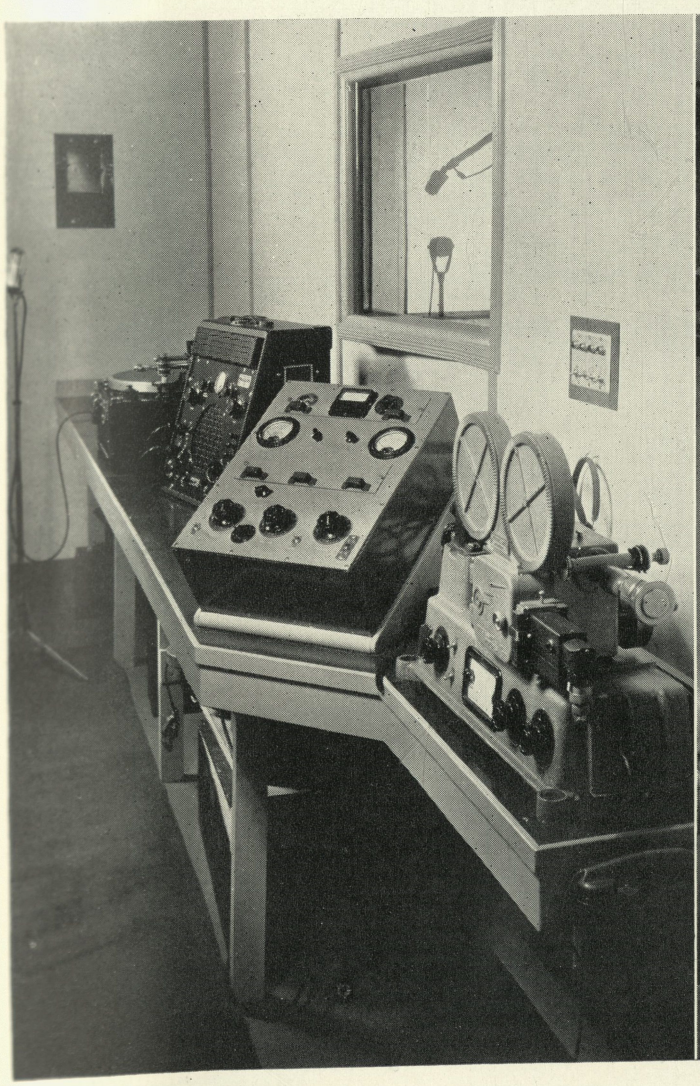
The larger producers in the theatrical field have their own laboratory equipment and those who do not can rely on competent service companies with complete 35mm. equipment. The producers in the 16mm. field have long felt the need of a service company with coordinated departments to handle the technical work involved in their productions.

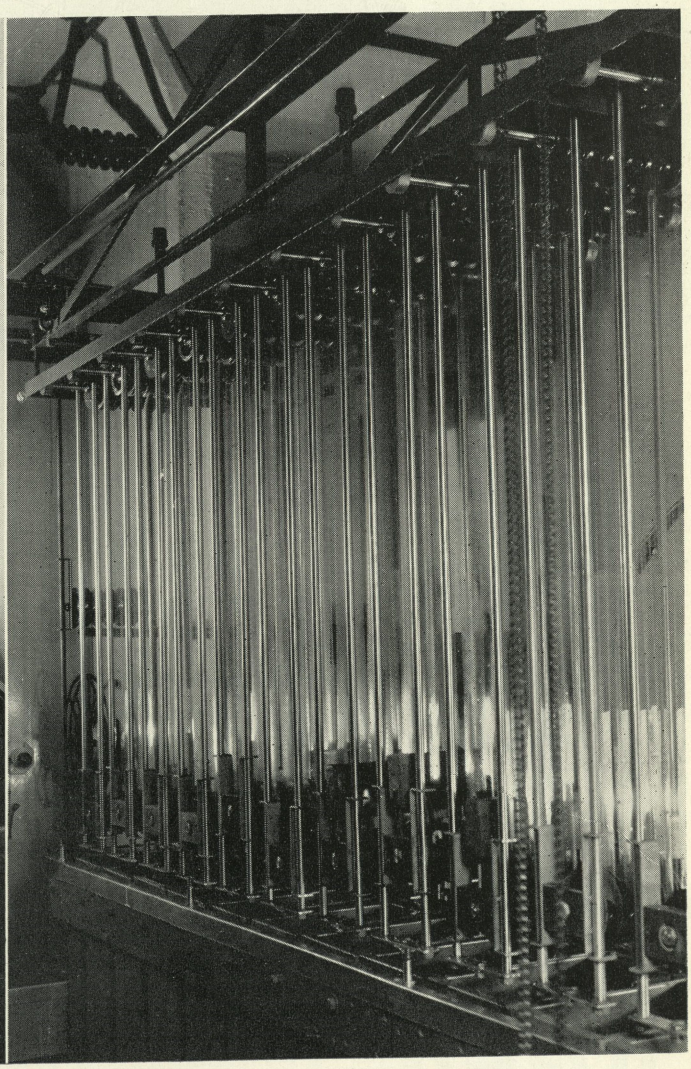
Pacific Laboratories, on the fourth floor of the Bekins Storage Building, 1027 N. Highland Avenue, Hollywood, has just recently completed the construction and equiping of a plant to render service exclusively on 16mm. film. It

(Continued on Page 517)

Left, Sound Recording Equipment of Pacific Laboratories

Pacific Laboratories' developing machine





"Dear Sir:
A few years from now...

. . . the folks are going to cherish the pictures they take of me today!"

You're right . . . providing those pictures are *good* pictures! And one way to insure good pictures is to use Agfa's 16mm. Triple S Superpan Reversible Film.

For better indoor shots and for slow-motion movies under difficult light conditions, Triple S Superpan has the necessary extreme speed, together with a remarkably fine grain, fully panchromatic color sensitivity and a well-balanced contrast. The final screen results will be exceptional for their depth and clarity.

Ask your dealer today for Agfa Triple S Superpan Reversible. He has it in 100-foot rolls at only $6.00 and in 50-foot rolls at only $3.25. These prices include processing and return postage. **Made by Agfa Ansco Corporation in Binghamton, New York, U. S. A.**

AGFA 16 MM. TRIPLE S SUPERPAN FILM

Agfa

STUDYING PHOTOELECTRIC EXPOSURE METERING

By CAPTAIN DON NORWOOD, U.S.A., RETIRED

THE use of photoelectric exposure meters is apparently becoming quite general among professional and amateur cinematographers as well as still photographers. For this reason it seems to be in order to make a study of some of the characteristics of the device to the end that better understanding will aid efficient use.

It seems that a photoelectric exposure meter pointed at a photographic subject just as a camera is, and measuring the same reflected light that the camera is going to impose on the sensitized film, should be an ideal instrument.

It seems that the results obtained from it should be nearly perfect. In actual practice, however, it is found that such is not always the case.

For a number of years my principal duty in the Air Corps was that of being in charge of instruction at an Army Air Corps Photographic School. During that period I observed the efforts of some hundreds of students in their determination of negative exposures by various means, including the use of photoelectric exposure meters.

Widely Varying Results

It was my experience that groups of students, after receiving careful instruction in the use of the meter, when sent out to photograph a given subject would later display widely varying results in negative densities. This condition persisted even after the students had become proficient photographers.

Conversations with many professional and amateur cinematographers and photographers served to confirm the observation that quite widely varying results may be obtained even with careful use of the conventional type of photoelectric exposure meter.

It was further determined that the conditions herein described seemed to be aggravated in the case of indoor photography with its somewhat greater contrasts. Likewise natural color film, such as Kodachrome with its inherently high contrast and narrow exposure latitude, presented quite a problem.

In the school these conditions were so marked that it seemed desirable to make a special study of the conditions surrounding determination of exposure by the use of the photoelectric exposure meter. Some of the results of this study are presented here.

Let us consider the exposure problems presented in some typical scenes, and see how the meter functions in each case. Figures 1, 2, 3, and 4 represent such scenes. Consider Figures 1, 2, 3, and 4 not as pictures to be examined for flaws, but rather as representative scenes to be photographed.

Figure 1

Meter Readings Affected

Scene 1 consists of a figure of a girl wearing a light dress, against a dark background. Illumination is by sunlight.

It has been observed that the most general method of using the meter is that known as the "Average Brightness Method." With this method the meter user measures the average brightness of the scene from a point near the camera position.

This is modified by some who move to a position nearer half-way between camera and subject to offset the effect of the very wide "acceptance angle" of the meter as compared with the "angle of view" of the camera.

It must be appreciated that for all practical purposes the meter is affected only by the bright portions of a scene. The dark portions have such small relative effect that their influence may be largely discounted.

In Scene 1 only a relatively small portion of the whole scene is composed of bright areas. A large portion is composed of dark areas. Consequently a meter reading for this scene will have a low value, and considerable exposure will be indicated.

Enters Second Girl

Now let us suppose that into this scene walks another girl, similar in size and dress to the original girl subject, and stands beside the first girl. Another meter reading is taken. With the advent of the second girl the bright portion of the scene has been about doubled in area. The additional reflected illumination acting on the meter will cause a reading roughly double the value of the original reading.

Let two more girls, similar in size and

dress to the first two, enter the scene and stand beside the first two. Now the bright area has been again doubled, consequently the meter reading will again be doubled.

Continue the process by adding four more similar figures to the scene which already has four. We find our bright area again doubled, likewise the meter reading has again doubled. We now have a meter-reading which is eight times that from the original scene. Consequently we have an exposure indicated which is one-eighth that indicated for the original scene.

Three f stops difference indicated. And yet the brightest highlight has not become more intense, nor the darkest shadow any lighter. An exposure which would be correct for the original set-up would be just as correct for the one last described. It is discovered that relative size of bright and dark areas in a scene have a most marked effect on the readings. This effect may be very misleading, as just shown.

Meter Follows Figures

Consider Scene 1 again. If we were to keep on adding brightly dressed figures until the scene were full of them the meter reading would keep right on increasing as shown and the indicated exposure decreasing.

By the time we had, say, 32 bright figures in the scene we would get about the equivalent of Scene 2. In Scene 2 the brightness is from the large area of light background.

This scene, which is illuminated by sunlight of the same intensity as in Scene 1, has the brightest highlight of about the same value as in Scene 1 and the darkest shadow also of about the same value as in Scene 1.

Let us digress here to say that if an exposure is adjusted so that both the darkest shadow and the brightest highlight are included in the exposure latitude of a film, it follows that intermediate values are bound to be properly recorded also, and the exposure as a whole is correct.

Now with Scenes 1 and 2 having identical brightest highlight values, and identical darkest shadow values, it follows that the same exposure would have been proper for both scenes.

The meter as we have seen gave us widely divergent indicated exposures for the two scenes. This was caused by the fact that this type of meter is affected so strongly by the relative sizes of light and dark areas in the scene, a factor which is of no importance whatsoever in the correct determination of exposure.

How Position of Meter Affects Readings

Now let us consider Figure 4, which is another representation of the scene in Figure 1. Superimposed on this scene we find several concentric circles. Circle A incloses the area which would be effective in reflecting light to an exposure meter used at one half the distance from camera to subject.

If the operator moves forward to a position three quarter of distance from camera to subject the area effective on the meter will be that inclosed by Circle B. Similarly for seven eighths of the distance see Circle C, for fifteen sixteenths; Circle D, for thirty-one thirty seconds, Circle E.

What will be the meter readings at these various station points? In A we find a relatively large dark area which has very little influence on the meter. The bright area is relatively small, so the meter reading will be low.

In B we find the dark area, which had practically no effect on the meter anyway, has suffered a reduction in relative area. The bright portion occupies relatively twice as much area as in A, consequently the meter reading will be approximately twice as great.

In C and D and E we get an extension of the same effect. In each case the bright area has become relatively greater in size, with a corresponding increase in the meter reading. The variation in the meter readings from A to E will be relatively large.

It will be seen how greatly meter readings are influenced by the position chosen by the individual photographer when taking a reading on the scene. It is evident that all of these readings cannot be correct. Some of them may depart rather widely from the figure which will give a correct exposure.

How Aiming of Meter Affects Readings

So far we have seen that readings from a reflection type photoelectric exposure meter are greatly influenced by the relative size of light and dark areas in the scene. The readings are further greatly influenced by the position chosen by the individual operator. The variations consequent on the influences considered may easily be of disturbing magnitude.

Figure 3 represents another scene in which the individual habits of the meter user may have quite a marked effect on results. Circle A represents the area included by one meter user. From the same position the second user will be found to point his meter down slightly, so that his meter "sees" the area in Circle B.

Similarly another user's meter "sees" the area in Circle C, because his meter is tilted upward slightly. A slight angular turn to right or left will give similar circles at the sides. Each of these circles inclose areas containing substantially different proportions of light and dark areas.

Thus, since the meter is sensitive to relative proportions of light and dark areas, it will be evident that a number of different readings may be had from the same scene. A small angular change in attitude of meter may make a marked change in the reading.

Multiple Reading Method

Some meter manufacturers advise the taking of a reading on the brightest highlight and the darkest shadow in a scene. This is doubtless the most accurate way in which the meter may be used. However it involves several problems. First the natural reluctance of the average photographer to take more than one reading on a scene must be overcome.

Next the problem of determining just where is the brightest significant high

(Continued on Page 524)

Figure 2

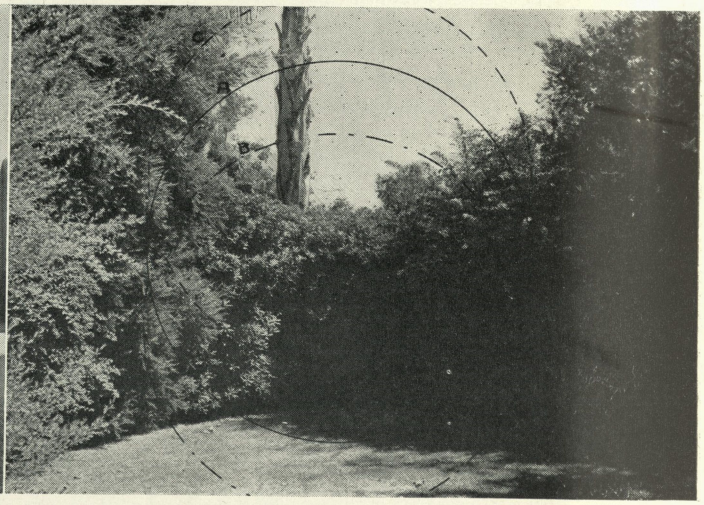


Figure 3

HISTORY REPEATED

PLUS-X, Super-XX, and Background-X have established themselves firmly as the favorite raw films of the industry. In doing so they have repeated the history of Eastman films of other days. And they have done it through the same means: unmatched photographic quality, completely trustworthy uniformity. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN

PLUS-X
for general studio use

SUPER-XX
for all difficult shots

BACKGROUND-X
for backgrounds and general exterior work

BRINGING HAWAII HOME

By ORMAL I. SPRUNGMAN

16mm. Kodachrome frame enlargements by Sprungman from Dan Billman Jr.'s "Hawaiian Honeymoon."

Titles filmed by Park Cine.

Enlarged from 16mm. color movie frame.

Waikiki's blue waters photograph best on clear days, turning silvery under clouded skies. This 16mm. Kodachrome frame enlargement by Sprungman from Dan Billman, Jr.'s, "Hawaiian Honeymoon," was taken from an outrigger canoe.

FILMING in your own backyard has its virtues. For instance, you don't have to worry about customs, tropical packing or irate natives. But nobody seems to care much about the scenery around Podunkville when Pago Pago, Haiti and Darkest Africa start calling.

Dan Billman, Jr., Minneapolis amateur cinematographer who shoots his films especially for public screenings, realized this. He knows the "escape" which travelogs offer to stay-at-homes, and he knows what constitutes good footage.

Hardly an hour ago Dan finished telling a local radio audience about the difficulties he encountered in filming his current 16mm. feature, "Black Cousins" (first reviewed in the May 1939 American Cinematographer).

He revealed how photographing through broken clouds produced his striking airplane footage, but he also told how police were called in with horse whips to drive off Haitian marketplace natives who had seized and attempted to run away with Billman's photographic equipment.

Right at this very moment Dan is probably laying out his cine plans for a coming winter excursion down among the tan-skinned Samoans, for it's the lure of far-off places, he claims, which adds sparkle to cruise photography and inspires a person to turn out the very best stuff he knows how.

Six Weeks Filming

Just one year before "Black Cousins" was born Dan hied himself off to Hawaii with his bride to produce his first full length color feature, "Hawaiian Honeymoon." Six weeks were required to film it. Fully edited and titled and synchronized with sound and music, the 1200-footer has been seen and heard by thousands of persons who proclaim it one of the finest ever to come out of these parts.

In fact, an abbreviated version of this feature was prepared and given a prominent spot last spring on the program of the Minneapolis Cine Club's Second Annual Movie Party.

It was along about the first few days of January 1938 that Dan phoned me he was Hawaii-bound. He wanted filming advice. I knew nothing about the islands, except that they were claimed to be a photographer's Eden. Admittedly as big a boob as the next fellow, I offered these suggestions, which might apply equally well for Egypt, India or the Antarctic:

Film the boat's departure. Get shots from the pier looking up at the boat, and shots from the boat looking down at the crowd. Catch a couple toots of the steamer whistle. Film the deck games, the swimming pool, and catch candid closeups of interesting fellow passengers. Get the captain at work.

Take a few shots over the railing, but step well back on the deck to frame each shot, including a part of the rigging in the foreground to lend depth to distant scenes. Try for similar shots at sundown against the western sky.

Because of heavy fog, the sailing from Los Angeles, originally scheduled for 10 p.m., was delayed twelve hours. This was advantageous, for the daylight departure permitted color filming of many of the introductory scenes mentioned above. In addition, Billman sequenced the tugboats and other liners following in the wake.

Sunsets Fair

He clicked over-the-bow shots of the frothy sea and gulls squawking and dipping to water. With deck tennis and swimming, the five days at sea pass rapidly, and soon Aloha Tower looms into view. Native boys paddle out to dive for coins.

Because of the rainy season, his sunsets were fair, but his general scene exposure was good, despite the fact that he had exposed very little Kodachrome before leaving on this jaunt.

Although he carried an exposure meter, he shamefully admitted that he toted no tripod and no telephoto. Both were included to advantage, however, in last winter's trip to the West Indies.

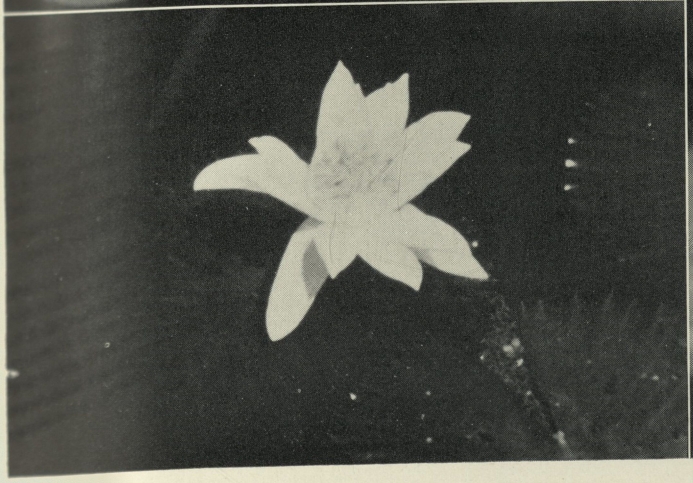
I further suggested that when he arrived on the island that he steer clear of conducted tours, that he purposely shoot the sort of thing which most average tourists might neglect.

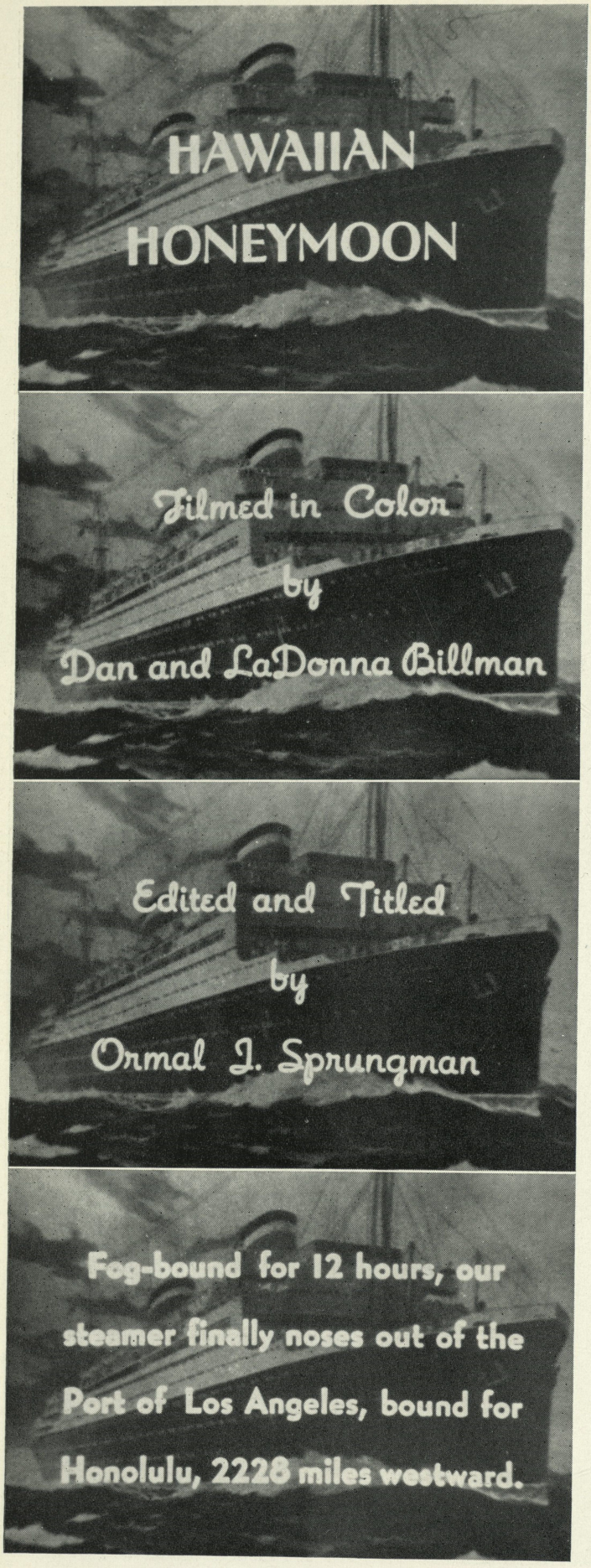
Since he was using Kodachrome exclusively, why not try for closeups of

The graceful hula unfolds the legends of early Hawaii.

Hawaii is famous for its odd tropical plants and luscious flowers.

No sailing is sadder, more impressive, than the departure from these picturesque islands.





a few of Hawaii's varied blooms, the hibiscus, for instance, and other flowers with color?

Then there were the natives, their dances, waving palms silhouetted against western skies, the scenic spots along the coastal highway, intimate closeups of native life inland.

After the Billmans established themselves on the island they visited the local tourist bureau in quest of tips on picture possibilities. They learned that the Eastman Kodak store at Honolulu actually furnished a map of the island of Oahu with such filming spots marked.

Hire Car and Chauffeur

In addition, the pair rented a car at a cost of $35 a week, hired a native Hawaiian as chauffeur and guide, and saw the out-of-the-way places quickly and efficiently, following spurs leading inland from the 100-mile stretch of coastal highway.

If you want to taste luxury and high life, stop at one of the hotels, but if you like informality Dan recommends renting an apartment along the beach, with the surf at your front door. Such apartments cost around $20 to $25 a week for short stops.

Preceding his street scene sequence, Billman took an angle shot of a Honolulu sign, followed with a closeup of a Hawaii auto license plate, simply to establish the locale. Too many photographers make their city filming a comprehensive architectural study.

Dan found out by experience that audiences are most interested in human activities than inanimate things, unless attractive or unusual. He had one fault in his municipal filming—a fault which he has since corrected. He panned.

Filming Honolulu streets from a lofty perch atop Aloha Tower, he yielded to the same temptation which has plagued many moviemakers by swinging his camera to encompass a goodly gob of the horizon.

The surf was tied up with coastal travel, and by closeupping colorful sign posts, he saved himself the bother of later titling. At one location, he filmed the statue of a Japanese fisherman's strange god at whose feet coins were tossed in the old days.

Weather Bad—Footage Good

A little farther along lay the Blowhole, where salt water spouted geyserlike out of a hole in shoreline rock. The rocks were slippery from the endless spray. In fact, only a week before, a sailor ventured too close and fell to his death. His body had never been found.

David's hut at Punaluu furnished plenty of local color. Trying to revive the ancient Hawaiian life, David girds himself with a loin cloth, digs in the field, grows his taro, and demonstrates the simplicity of his grass hut existence. It was 4 p.m. and raining when the Billmans focused their camera on David's hut, but they came away with some excellent color footage at f.1.9, despite bad weather.

At Kapiolani Park, against a natural backdrop of palms and huts, more than a score of native girls stage a free hula demonstration which literally devours countless dozens of rolls of Kodachrome. In filming the performance, Dan squatted low on the ground in front of the spectators, and, by shooting up at an angle and watching backgrounds, he was able to eliminate completely any sign of the audience of some 500 tourists.

By alternating his long shots with closeups of smiling faces, expressive hands and dancing bare feet, he gave the impression that the hula was staged especially for his camera.

The same native lad who poses for the pineapple ads next shinned up a tree, fetched down a cocoanut, debarked it and proceeded to drink the juice.

Tasted Like Wall Paper Cleaner

Then he sat down on the ground and began mashing taro roots into a putty-like poi which Billman admitted looked and tasted like wall paper cleaner. Such closeups, sans curious onlookers, added much to his travel film.

Hawaiian flower closeups were taken with the one-inch lens at two feet, the closest working distance, and some of

the huge petals actually filled the screen. Unfortunately, the night-blooming cereus was out of season, but the "pot of gold" which pops into bloom was filmed in action simply by following a closeup of a closed flower with a quick closeup of an open one occupying the same area in the view finder.

When the sequence is projected on the screen, the popping effect seems very natural. And then there were the hibiscus, the water lilies of Mauna Loa Gardens and the groves of Papai trees.

One of the most spectacular sights, according to Billman, is the Nuani Pali, the 1200-foot cliff of sheer rock over which the great King Kamehameha in 1795 drove thousands of warriors. Legend has it that if this drive is made by car at midnight, the sound you hear is not the howl of wind, but rather the tormented screams of dying men.

The islands are famous for their strikingly colorful sunsets viewed through the Royal Palms of Kapiolani Park. Billman brought back some of these gorgeous sunsets on celluloid, filming not only the sinking orb itself and the Kodachrome-dyed clouds, but also the afterglow in the sky overhead.

Risk Camera

In every shot some object was silhouetted in the foreground to aid composition. The usual exposure on his sundown shots was f.5.6, while the sun could still be seen, opening up to f.3.5 after the sun dropped below the horizon.

Perhaps the most exciting footage in "Hawaiian Honeymoon" resulted when the Billmans chartered an outrigger canoe, hired four strong-armed native paddlers, and rode out into the Waikiki surf—despite warnings that many once-active cameras now lie mossy and dormant on the coral reefs below.

Swathing his movie outfit in bath towels, Billman filmed the lightning speed ride up the wavy crests, with surf riders and outriggers passing on each side. Each time the canoe would fill to the gunwales with water, and each trip back meant wiping the lens and camera free of spray.

Since Waikiki faces west, Billman advises that the afternoon is perhaps the best time for shooting outrigger action movies, but the day must be clear for Kodachrome filming. Clouds seem to destroy the true beauty of Waikiki's blue water.

The noon-day sailing for home provided a finale sadder and more impressive than most departures from picturesque ports. The strains of "Aloha Oe," played at the pier by the Royal Hawaiian band, fade away in the distance as the ship rounds Diamond Head. A sunset at sea, framed through the rigging with a gull winging about in the scene, closes the picture.

Editing 1500 feet of Kodachrome down to 1200 feet with titles happened to be the job of the janitor of this piece. First, those scenes a bit off in exposure were eliminated, then the lengthier footage was cut to fit the importance of the subject.

100 Feet of Titles

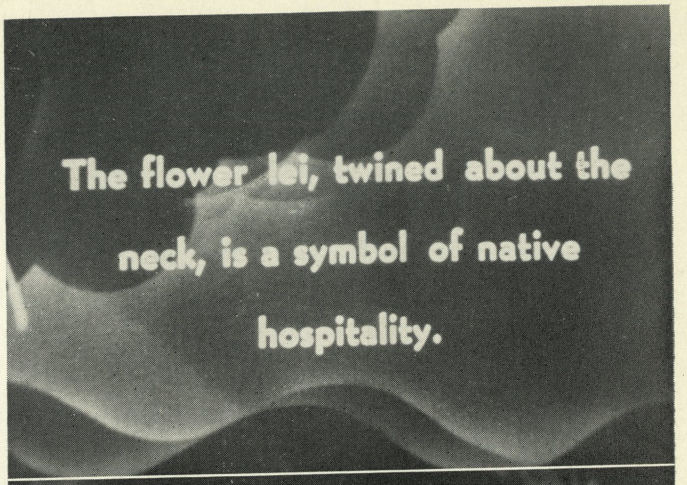
Approximately 100 feet of double exposed titles, with appropriate fades, dissolves and wipes were included, but to give the final touch the 45-minute screening was synchronized with music and sound effects.

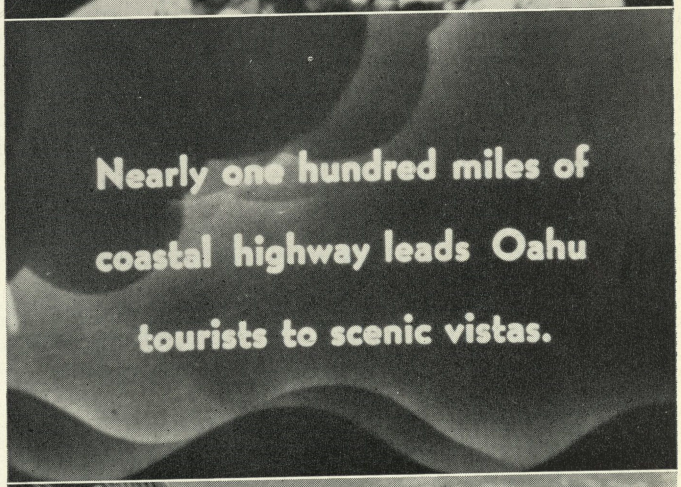
Such disc-recorded sounds as whistles blowing, gulls squawking, airplanes roaring and birds singing were dubbed in at appropriate places. Island recordings of hula music and the "Aloha Oe" of the Royal Hawaiian band were purchased in Honolulu and used in scoring the film.

Employing two RCA record players and an RCA amplifier-loud speaker unit with microphone, Billman was able to give a celluloid presentation as effective as a sound-on-film feature.

Among suitable musical selections for his Hawaiian film accompaniment were "Paradise" (introductory scenes), "My Little Grass Shack" (David's hut), "Tomi Tomi" and "Cock-eyed Mayor" (hula scenes), "Little Brown Gal" (tree-climbing and poi-making), "Sweet Leilani" (flowers), "Heeia" and "Kukuna Oka La" (surf riding), "Hawaiian Paradise" (sunsets) and "Aloha Oe" (departure for home).

If Dan Billman ever returns to Hawaii again—and they say





that most folks usually do return not once but many time — he claims he would visit and film the other islands in the chain, shooting some stuff from the air if permitted.

He says he would include sidelights on sugar cane and pineapples, close-upping the native fishermen, island wildlife and the odd forms of marine activity.

Briefly, if you want your film to appeal to audiences with diverse interests, shoot the sidelights which lie off beaten paths.

EASTMAN ISSUING TWO CLASSY CAMERA MODELS

FEATURING automatic film-wind control and a body shutter release which retracts automatically when the camera is closed, two new fine-camera models—the Kodak Monitors Six-16 and Six-20—are announced by the Eastman Kodak Company, Rochester, to be ready in November.

Designed to appeal to critical purchasers, the Kodak Monitors are wholly made in the Kodak Rochester factories. Their special features include strong aluminum alloy bodies and backs; a new system of bed braces which provides 10-point support to maintain the lens and shutter rigidly in accurate position; mechanism to prevent double exposures; both eye-level and waist-level finders; a monitor turret with automatic exposure counter, field depth scale, and range-finder clip, and a single push button to control both opening and closing.

There are four Kodak Monitor models. With 5-speed Kodamatic shutter and Kodak Anastigmat f.4.5 lens, the Six-20 Kodak Monitor retails at $30; the Six-16 at $35. Both these models are covered in tooled, black morocco-grain Kodadur. The other two models, with the outstanding new 9-speed Kodak Supermatic shutter and Kodak Anastigmat Special f.4.5 lens, retail at $42.50 for the Six-20 and $48.50 for the Six-16. Both these have a black pin seal grain genuine leather covering and highly polished chrome bed braces with black enamel inlay.

The film-wind control of the Monitors is simple and dependable. A small lever on the monitor turret is set at "wind" and the film is moved until the numeral "1" appears in the red window in the camera back. The lever is then shifted, the exposure counter dial set at "1," and the first exposure made.

For each succeeding exposure, the winding knob is simply turned until it stops, the film then being automatically centered. After the eighth exposure, the control lever is returned to "wind," so that the balance of the film and paper trailer can be wound on the take-up spool. Exposures are counted automatically by the counter dial on the turret.

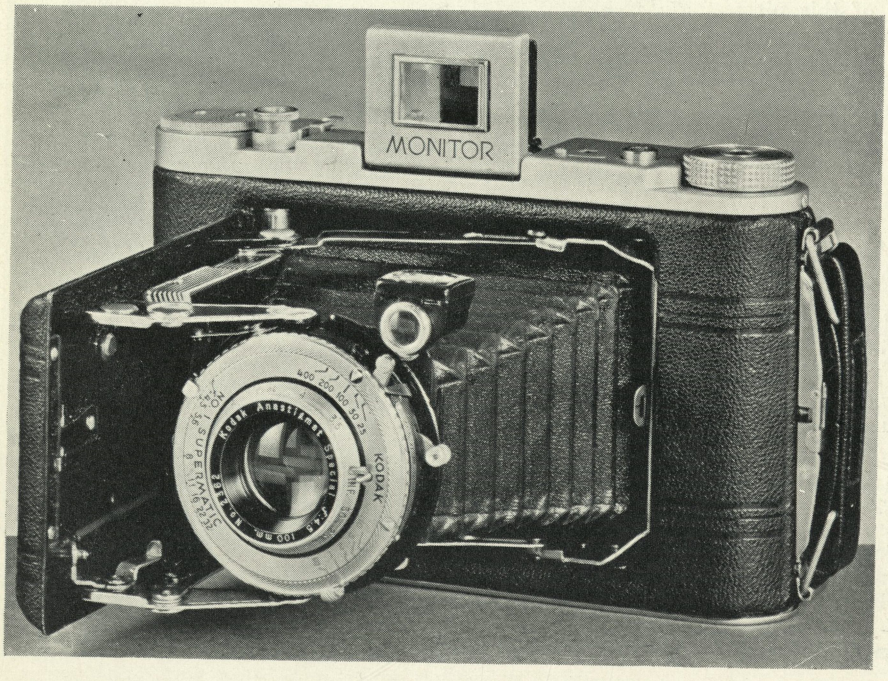
All Monitors take large pictures—the Six-20s eight 2¼x3¼ pictures on a roll of Kodak 620 Film; the Six-16s, eight 2½x4¼ pictures on a roll of Kodak 616 Film. In styling, precision of construction, and performance, they will rank high in the Kodak fine-camera line.

A new line of fine cameras covering a wide price range—the Kodak Vigilants Six-20 and Six-16—are also announced by Eastman.

The Kodak Vigilant line offers a total of eight models—four in the group of Six-20 cameras taking pictures 2¼x3¼ inches; four in the Six-16 group taking 2½x4¼-inch pictures.

Construction features include bodies and backs of special high-grade aluminum alloy for strength and rigidity; a new system of bed braces with 10-point support for maximum rigidity of lens and shutter mount; body shutter release with large rounded-head plunger, which retracts automatically as the camera is closed, preventing accidental exposures; both eye-level and waist-level view finders; special latch to prevent accidental opening of the loaded camera; and tripod sockets for vertical and horizontal positions, as well as folding supports for leveling the camera in vertical or horizontal position on a flat surface.

All handsomely finished, and precisely constructed by fine camera craftsmen in the Kodak Rochester factories, the Kodak Vigilants are available at prices ranging from $14.50 to $42.50.



The Kodak Monitor with f.4.5 Kodak Anastigmat Special lens and nine-speed Kodak Supermatic shutter.

Nielsen of Tucson Thinks Movies Should Follow Candid

Charles Nielsen, manager of Martin Drug Store No. 1 of Tucson, Arizona, and whose particular "baby" is the photographic department, has again "hit the bell" with a successful sales idea.

A short time ago Nielsen sold Pima County a movie camera for use in "mugging" drunken driving suspects, and it has proved very successful.

His latest is the sale of a candid camera and equipment to the director of the Pima County welfare board. This camera is to be used to snap scenes of poverty and filth that will be of value in impressing upon the people of Pima County the fact that they have a real welfare problem on their hands.

Nielsen hasn't said as much, but he probably figures that the welfare board will soon be in the market for a movie outfit to further and supplement the work started with the candid camera.

Bell & Howell Reduces on Filmo Camera 70-E and 70-DA

An announcement from Bell & Howell Company states that effective October 1, Filmo 16mm. model 70-E and 70-DA cameras will be reduced in price. The figures quoted are on cameras with Taylor-Hobson Lens, new prices being named last, as follows:

Model 70-DA, 1-inch F 2.7 focusing, former price, $213; new price October 1, $193; 70-DA, 1-inch F 1.5 focusing, $243.50, $223.50; 70-E, 1-inch F 2.7 universal focus, $124, $99.50; 70-E, 1-inch F 2.7 in focusing mount, $139, $114.50; 70-E, 1-inch F 1.5 in focusing mount, $169.50, $145. Lens prices remain unchanged.

Here Are Tips on Editing and Splicing

By JAMES A. SHERLOCK

Photographs by Writer

SYSTEMATISE your splicing, titling and editing. Meditate and enjoy the most interesting part of movie-making by editing your film in a way that each change of scene will be as smooth as possible.

There are many systems for editing, titling and splicing that can be used to rearrange scenes so that the film will have continuity and finish.

If a film be shot to a working script it is an easy matter to assemble scenes in their correct order, but if a reel contains a jumble of snapshots more thought and care are necessary.

With a little meditation, systematic editing, titling and perhaps the addition of a few extra shots, the most commonplace film can be made attractive.

A caravan holiday was recently filmed, the scenic portion of the tour being emphasized but closeups of the two holiday makers forgotten. This film has been improved by the introduction of a comedy angle. Various scenes have since been taken to show that Frank allows Kay to do all the work while he eats and sleeps.

These additional shots have been taken at weekend picnics, using scenery that will match the original. If the scenic background was not suitable the sky was used. When the film is projected the audience jump to the conclusion that these well matched sequences were shot en route.

Projection Comes First

The first step when editing is to project the film. If the cutting has been done in the camera matters are simplified, but if the reel contains a mixture of unrelated scenes more time must be spent at the editing bench.

The editing bench illustrated is practical and contains many helpful gadgets.

The cardboard box (1) has each compartment numbered on the side to simplify the indentification of each piece of film. This box contains a lid which is kept closed when the bench is not in use. The numbers have been cut from an office desk calendar. If a simular box is unprocurable pill boxes can be mounted on a board and similarly numbered.

On the working script is lying a pair of scissors (2) the liberal use of which should not be neglected. A Kodak film viewer (3) has a notching arrangement which permits any individual frame to be selected and marked, but has the fault of requiring the film to pass through it in the form of the letter "z."

The splicing block (4) and rewind are made by Bell and Howell and mounted as one unit. Each spindle (7) is geared. On the left hand spindle (5) is a Kodak reel which has one side removed. This is done simply by loosening four small clips which attach each side of the reel to the hub. When the film is wound on this one sided reel it can quickly be removed in one piece and placed in it's compartment without becoming twisted.

In the center of the bench is placed a piece of opal glass (6). Underneath is a light which permits the film to be speedily examined without putting it through the viewer.

Don't Unwind Film on Floor

Do not unwind film on the floor. Apart from the film collecting grit and dust it is also liable to be trodden on. Have a waste paper basket lined with a soft washing material. This will hold about 400 feet of unwound film

While this editing bench is practical and convenient many variations are possible.

Small geared emery wheels can be purchased at chain stores, mounted on a board about 4 feet by 1 foot, and with the emery stone removed serves as an excellent winder.

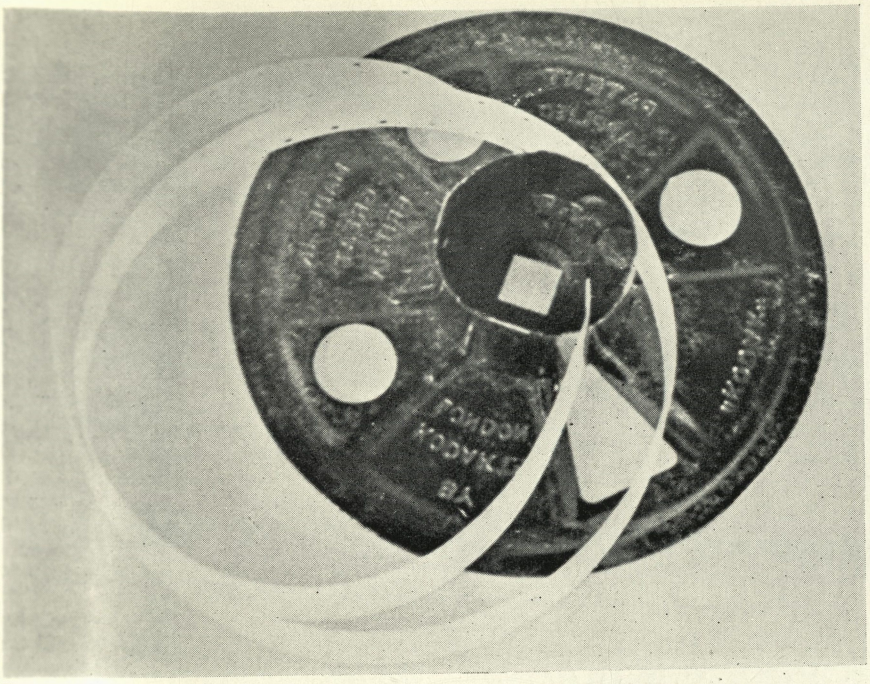
The film viewer can be substituted by a magnifying glass or linen tester held over a piece of opal glass with a light behind it. This might be placed in the center of the board containing the rewinds. The splicing block can be replaced by a Kodascope film splicing outfit mentioned elsewhere in these articles. The whole of this outfit would not cost £1. ($4)

Make Record Each Scene

When the editing bench that suits your requirements is complete project the film a few times till you are sure you know each scene, then with pencil and paper make a record of each scene, not forgetting such things as:

1. Faulty exposures.
2. Shots that are too long.
3. The photographic tone or colour of each scene as the jump from

Make a habit of using white cotton gloves when editing.



Kodak reel with one side removed is used for winding film.

a dark to a light scene is unpleasant to the eye.

4. The direction of movement, e.g., figure or vehicle moves to right, left or stops.

Now from your record study the scenes. From the best of these arrange a plan of continuity. If extra shots are needed note these and any titles that are required.

When this is done cut the film and place each piece in a compartment of the editing box where it can be quickly found. The titles and extra shots are then made and added to the editing box in the same manner.

Again study your notes which identify each strip of film and number them in the order in which they are to be joined. Be sure you have a continuity of shots that will make an interesting story. The film is now ready to be spliced.

Splicing

If a film has been carefully edited, it will contain many splices, and unless these have been skillfully made they will spoil a good film. This is one phase of moviemaking that the amateur often neglects.

A bad splice will cause the film to jump out of focus when it passes the pressure plate of the projector or will cause a breakdown in your show if the joints do not hold. In the case of Kodachrome, unwanted bright red spots will appear if the film is wound on a take-up spool when the cement is not thoroughly dry.

The price of a splicing outfit is not a gauge to its efficiency. The Kodascope film splicing outfit contains no moving parts to wear, is cheap and very efficient. Elaborate outfits are more automatic and make the job less tiresome, but should be tested before being purchased to be sure they make a neat joint, do not damage the sprocket holes and at the same time leave these holes correctly spaced. Make these tests with a magnifying glass.

As to Splicing

If care has been taken when making the splice the film should be as strong at a joint as it is in any other spot. The two pieces of film should be welded by cement into one piece and the sprocket holes clean of cement.

A splice may be at right angles to the edge of the film or diagonally across one frame. Neither method is perfect. My preference is for the Bell and Howell splicing block. It uses a dry scraper with a blade, not a file, that can be set to the correct depth, making it possible to remove emulsion with a clean cut edge and at the same time not interfere with the base of the film.

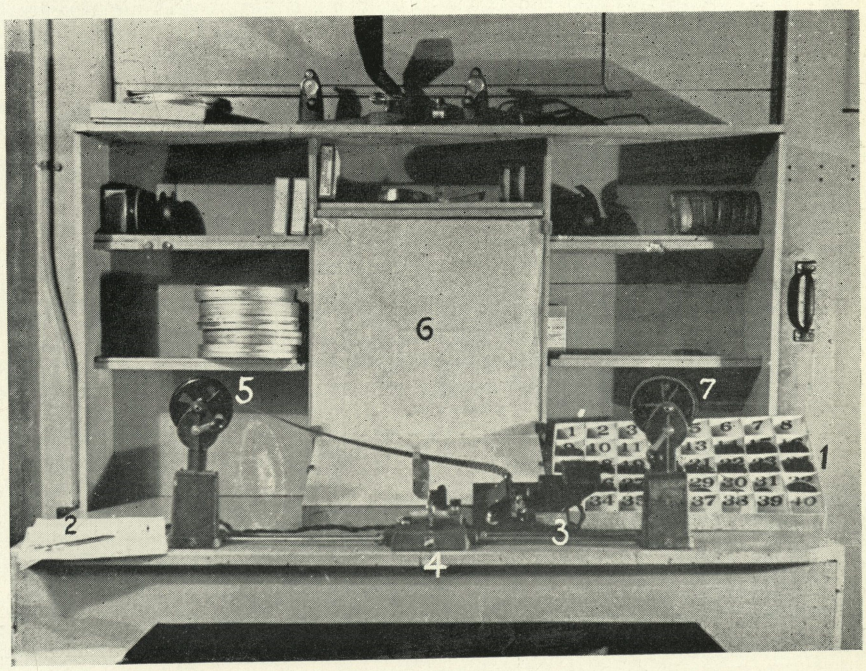
The wet scraping method is not as efficient. The water is liable to spread more than is needed, causing spots to appear at the joint. In the case of colored film, unwanted colored spots are seen.

With both methods it is essential that all emulsion be cleaned from the film in order that the two pieces of film will fuse evenly when cement is applied. To make doubly sure of this, the piece of film which is to be welded to the scraped portion should be moistened with cement and quickly wiped. This will leave a rough edge that will fuse quickly.

The less cement used the neater the joint and the longer it is left between the pressure plates before testing the stronger it will be. Do not strain the joint when making the first examination as the cement takes a considerable time to thoroughly dry. One minute should suffice to leave the film between the pressure plates.

The cement should be of the consistency of water and made by the same manufacturers as the film. Make a habit of using white gloves when handling film on the editing bench.

Even when in the act of splicing keep a cork in the bottle of cement to prevent evaporation and deterioration and always have a new bottle on hand.



Editing bench.

EDUCATING 300,000,000 WITH 16MM. MOVIES

By A. J. PATEL, F.R.P.S., F.R.S.A.

Chairman Photographic Society of India

WHEN you talk of education to some of the elderly men in a country like India, you can expect the reply: "Education at this age? What for?" It is really difficult to persuade a shy, modest man to go to school, even though all the facilities of time and money can be arranged easily.

India is a peace-loving country, and has hardly thought of struggling to have more than the strictly necessary things of life.

In other words, we do not want to be uncomfortable to get the comforts of life. And when a man has lived thirty, forty or fifty years, made his living and raised a family, without education—without even knowing how to read and write—it is hard to make him take the path back to what he considers the childish thing of going to school.

It is also difficult to get the children of such people in schools, when their fathers, and their fathers' fathers before them, have lived without education. Neither they nor their parents have had any opportunity to see that education would or could be of any value in their daily lives.

It may not, perhaps, be their fault, since nobody had ever attempted to show them in practical terms they could grasp, how proper education may help them to live better, happier lives, and perhaps make many things easier for them.

Education Not Compulsory

Education in India is not compulsory, so unless the fathers can be made first to appreciate the usefulness of education, one cannot expect to see their children in the schools.

That is why in India today about three hundred million are uneducated. And though today it may not be either possible or necessary to give them a formal school education, it is necessary to educate them in a practical way—to give them knowledge that will help them live better lives, that will give them a practical understanding of their daily work which may be useful not only in increasing their happiness, but in helping to build up the present and future industries of India.

Like many of those of my countrymen who have had the privilege of education, I have thought deeply over this problem, one of the gravest confronting my nation today. As a photographer, I have felt that motion pictures are the most likely method of solving the problem, and I am setting about to begin to apply them to it.

Motion pictures are interesting, in the first place; they catch people with their guard down in a way no written or spoken word can ever do. In addition, they are the only satisfactory way of giving education to people who can neither read nor write and who do not have the blessing of one nation-wide language.

India, as you know, is a vast country with innumerable villages. Between these villages are no good means of transportation. Neither do most of these villages enjoy such modernities as electric power.

In many districts each village has its own local dialect, which differs so much from that of its neighbors as to be almost a distinct language. All told, there are over three hundred languages and dialects spoken in India.

No Common Language

And there is no common language; even though English is the official and increasingly the business speech of the nation, the villagers could not be taught in it, since they do not understand it at all.

So to apply visual education to India's millions we must have projectors which can be transported easily from one place to another and which do not necessarily have to be supplied from metropolitan lighting circuits. And above all, the pictures used must not depend upon either spoken or written words to convey their meaning.

All of these facts point inevitably to the use of 16mm. silent films. The projectors weigh less than even the lightest "portable" 35mm. machines, and are much less bulky. They may be carried almost anywhere.

Batteries or hand or wind-powered portable generators will solve the current-supply problem. And as for the use of silent films, how else can you convey information to illiterate people of many tongues without the use of either written or spoken words. Besides, as Confucius said, "One seeing is worth ten thousand tellings!"

Here, therefore, is how we are planning to put the project into practical operation. The Educational Film Institute of Germany will serve as our pattern.

On my recent trip to Europe, I made a careful study of the operation of this institute, which has attacked the practical problems of supplying educational films and projectors to schools with typical teutonic efficiency.

Germany 2000 Subjects

This institute has placed 34,000 projectors in 56,000 schools and has available some 2000 subjects to show on these projectors. In the many instances where the school cannot finance the purchase of the necessary equipment the institute provides it. Thereafter a nominal charge is made to the pupils who benefit from the films.

A fee of about ten cents is charged to the first child in a family; the second pays half-fee, while the third child does not have to pay. The proceeds from these charges are used partly to pay for the equipment furnished and partly to pay for the films supplied. From 150 to 200 different films are shown to every school within a year's time.

The films are made by professional producers working under the direct supervision of the institute. In many cases they grow from ideas suggested by the teachers who use the films or by the institute's own educators.

Treatment and presentation are supervised by educators. The subjects cover an extremely wide range, from the more formal educational subjects to such purely practical things as household necessities and factory or field work.

Returning to India, we feel that we can apply much of this plan to our own immediate needs. We will start with a limited number of projectors and expand as fast as is practical.

Before we are able to produce all our

(Continued on Page 519)

Film-wise Movie Makers

RELY ON

CINÉ-KODAK FILM

For More Brilliant, More Satisfying Home Movies

THERE are four different kinds of 16 mm. Ciné-Kodak Film; three 8 mm. Ciné-Kodak Films. Within those varieties film-wise movie makers find the answers to even the most diverse problems. They know that they can depend on the uniformity of Ciné-Kodak emulsions; they rely on the scientific processing which, at no extra cost, complements their care in making the exposures.

The movies worth making are made on Ciné-Kodak Film.

16 mm. Ciné-Kodak Films

SUPER-X offers superb photographic quality, fine grain, ample speed, and remarkable latitude. Available in 50-, 100-, and 200-ft. rolls, and 50-ft. magazines.

* **SUPER-XX** gives you all the speed you're likely to need—plus excellent general quality. In 50-, 100-, and 200-ft. rolls, and 50-ft. magazines.

KODACHROME, available in two types, one for use by daylight and one for Photoflood work, is the full-color film beyond compare. In 50-, 100-, and 200-ft. rolls, and 50-ft. magazines.

SAFETY "PAN" combines quality and economy; for use where the special capacities of the other films are not required. In 100-ft. rolls only.

8 mm. Ciné-Kodak Films

SUPER-X, with its high speed, brilliance, and fine grain, is the new favorite for indoor work, or for outdoor movies, stopped down for maximum definition.

"PAN," the original "Eight" film, still offers beautiful quality, wide latitude, and basic economy.

KODACHROME, in its two types, gives 8 mm. movie makers full and facile command of the whole world of color.

* *[Good news for 16 mm. movie makers. The price of the 100-ft. roll of Super-XX has been reduced from $7.50 to only $6.75, the 50-ft. magazine from $4.25 to $4.]*

EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

DENSITOMETRY AND ITS APPLICATION TO MOTION PICTURE LABORATORY PRACTICE

By EMERY HUSE and GORDON CHAMBERS
Motion Picture Film Department Eastman Kodak Company, Hollywood, California

In Three Articles—Article III

C. Physical Densitometers

THE physical densitometer, in substituting a light sensitive cell for the human eye, offers promise of greater repeatability of density measurement. Continuous use of a visual densitometer results in eye fatigue and, over a period of time, such monocular observation results in a weakening of the convergence ability.

1. Early physical densitometers.

A densitometer using a Case Thalofide cell was described by Schoen[9] in 1923. This instrument was constructed for a special purpose and had only a limited density range. The electrical output was very low and a high sensitivity galvanometer was required. The light source was moved to and from the cell surface to obtain a constant cell output, the lamp position being a measure of density. This cell tended to show drift due to slow changes in internal resistance. With the advent of more stable cells this apparatus was dismantled.

The first physical densitometer used by the authors, which was in 1926, was a selenium cell device made for the British Photographic Research Association. A movable mirror allowed the measuring beam through the density or the comparison beam through a wedge to be presented to the cell which was connected to a galvanometer. When equal deflections were obtained in the two beams the density was determined by the setting of the previous calibrated wedge. This instrument was in many ways the counterpart of the Eastman visual densitometer. The density range of the BPRA instrument was limited by the cell sensitivity and its operation was slow.

2. Instruments in Current Use.

a. Deflection Type.

In 1935 F. L. Eich[10] of the Paramount West Coast Laboratory described a deflection type physical densitometer in which a barrier type cell was used. This original instrument continues to be in daily use. The barrier cell has a number of advantages. The cell is stable, has a fairly high output in microamperes and works best into an output circuit having a very low impedance. The use of this cell obviates the necessity of an amplifier with its attendant difficulties. The density range extends from 0.0 to about 1.0 but this range can be extended by increased scale length or the introduction of suitable matching networks between the cell and the meter. The original model used a Weston Photronic cell, a model 440 Weston meter of 30 microamperes full scale deflection and a storage battery to supply a steady current to the lamp. It is essential in a densitometer of the deflection type that the lamp current supply be very stable. In similar instruments now being supplied by C. S. Franklin, a Raytheon regulator of suitable capacity is used for this purpose. Several improvements in these Franklin instruments over previous ones of the same type have not been disclosed by publication.

In 1937 Lindsay and Wolfe[11] described a constant deflection type densitometer having a range from 0.0 to 2.7. In this instrument the light beam is interrupted by a rotating sector, or "mechanical light-chopper," between the source and the photocell. The cell output, with proper impedance matching, is fed to the grid circuit of a multiple stage amplifier. A logarithmic gain control in an intermediate amplifier stage is used to maintain the output of the final stage at a constant value and the gain setting is a measure of density. Suitable key-switch controlled fixed networks divided the total range into three equal parts having slight overlaps.

b. Null Type.

The null type of physical densitometer where the outputs from the test and the comparison beam are simultaneously opposed to produce zero deflection of a galvanometer overcomes most of the objections to the deflection type in that variations in the light source are cancelled out by their equal effect on both beams and further because it becomes possible to dispense with an amplifier. In the constant deflection type densitometer the amplifier problem is lessened by the fact that it may be non-linear but it still requires constant voltage and filament supplies, no small problems in themselves.

A recording densitometer operating on the null principle has been described by Tuttle[12] who, together with Russell[13], has also reported the results of a year's use of the instrument. One of these instruments has been in routine use for more than a year in the Motion Picture Film Department Laboratory in Hollywood. A great deal of preliminary work was done on this instrument during its design by Tuttle and Hiatt[14]. The conditions set

TABLE III

Density as Evaluated by Various Densitometers

Pot Opal	Pot Opal (Base to Opal)	Heavy Flashed Opal	Medium Flashed Opal	Light Flashed Opal	Sphere (Emul. to Sphere)	Sphere (Base to Sphere)	Photocell (Image in Contact with Element)	Photocell (Quartz Rod)	Contact Printing
0.000	0.000	0.012	0.017	0.020	0.030	0.032	0.012	0.022	0.04
0.100	0.107	0.112	0.120	0.155	0.119	0.128	0.112	0.125	0.14
0.200	0.212	0.212	0.223	0.282	0.209	0.223	0.212	0.229	0.24
0.300	0.316	0.312	0.326	0.407	0.302	0.319	0.312	0.332	0.33
0.400	0.420	0.412	0.429	0.530	0.394	0.415	0.412	0.434	0.43
0.500	0.522	0.512	0.532	0.652	0.487	0.510	0.512	0.537	0.53
0.600	0.623	0.612	0.635	0.773	0.581	0.606	0.612	0.641	0.63
0.700	0.724	0.712	0.738	0.893	0.675	0.702	0.712	0.744	0.73
0.800	0.825	0.812	0.841	1.013	0.769	0.797	0.812	0.847	0.82
0.900	0.926	0.912	0.944	1.131	0.864	0.893	0.912	0.951	0.92
1.000	1.027	1.012	1.047	1.250	0.959	0.989	1.012	1.054	1.02
1.100	1.128	1.112	1.150	1.368	1.054	1.084	1.112	1.157	1.12
1.200	1.228	1.212	1.253	1.485	1.149	1.180	1.212	1.260	1.22
1.300	1.328	1.312	1.356	1.602	1.245	1.275	1.312	1.374	1.31
1.400	1.429	1.412	1.459	1.719	1.340	1.371	1.412	1.477	1.41
1.500	1.529	1.512	1.562	1.835	1.436	1.467	1.512	1.580	1.51
1.600	1.629	1.612	1.665	1.951	1.531	1.563	1.612	1.684	1.61
1.700	1.730	1.712	1.768	2.067	1.626	1,659	1.712	1.787	1.71
1.800	1.830	1.812	1.871	2.183	1.722	1.754	1.812	1.890	1.80
1.900	1.930	1.912	1.974	2.298	1.818	1.850	1.912	1.994	1.90
2.000	2.030	2.012	2.077	2.413	1.914	1.946	2.012	2.097	2.00

forth in the early part of the present paper as necessary for the measurement of true diffuse have been applied in the design of Tuttle's instrument by a unique mounting of the barrier type cell used. The scanned area of the silver deposit, which is slightly less than seven millimeters in diameter, is immediately adjacent to the cell surface which is forty-five millimeters in diameter. The emulsion side of the film is placed toward the cell surface which is protected by a thin layer of plastic.

Light flux from the monoplane filament source is divided by a beam splitter between the test and the comparison fields. That on the latter is constant while a double logarithmic mechanical diaphragm moving in a collimated beam serves to establish the balance in the test field. As in the visual Eastman Densitometer, all of the "wedge" is in position when no density is in the test field. The introduction of an unknown density is then offset by decreasing the density, in this case increasing the width, of the mechanical wedge. The cell outputs from the two beams are opposed onto a marine galvanometer and at a fixed point, zero deflection, the unknown density is determined by the position of the mechanical wedge. In this particular instrument additional facilities are provided in order that the density values may be successively recorded on graph paper by the discharge of a spark which perforates the paper. The scale of the graph paper is arranged so that the step interval along the abcissa, the Log E axis, is the same length as that of the step on the strip. The recording densitometer is specifically designed to read sensitometric strips exposed on an Eastman IIb sensitometer. Because of the size of the scanned area it cannot be used to measure sound track.

Like the Eastman Densitometer of the visual type, the automatic recording densitometer is secondary in nature, the mechanical wedge requiring calibration against a standard. The instrument used as a standard for this calibration was that described by Jones[15]. Comparison of density readings obtained on the automatic densitometer with results obtained on the same film using an Eastman visual densitometer indicates that the visual readings on high densities are higher by about .04 than those given by the automatic. It is because of such discrepancies that the authors feel it very necessary that international standards be agreed upon for density measurement.

A number of other papers not cited here have appeared in the journals describing physical densitometers. Readers interested in the construction of such instruments are recommended particularly to the paper by Tuttle and Hiatt[14] previously mentioned in order that the rigorous conditions there set forth for diffuse density measurement may be studied.

Standardization

It would appear reasonable that the values obtained as diffuse density for photographic deposits should represent the contact printing characteristics. It is desirable, therefore, that in standardizing on a method for the evaluation of density that the optical system used should be capable of collecting all of the emergent light from the sample being measured. Tuttle and Koerner[16] described the results of a number of experimental determinations of density. Careful photometric tests were made to measure the contact printing density and these values are related to measurements made with an integrating sphere and also results from an opal glass densitometer in which a series of opals of various diffusion characteristics were used.

In Table III, which is reproduced from the paper mentioned, are given the results which show the variations in density obtained with the various systems of measurements. Examination of these data shows maximum variations between various densitometers of the order of 20%. On the basis of these results the authors in a later paper[17] have proposed the adoption of the integrating sphere as a primary instrument against which densitometers in practical

(Continued on Page 520)

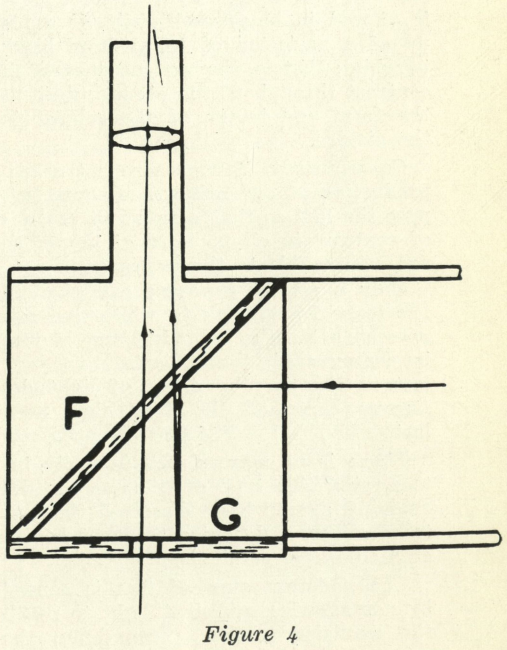


Figure 4

SOME NOTES ON EXPOSURES FOR BEGINNERS

By CLAUDE W. CADARETTE

Founder Los Angeles 8mm. Camera Club

THE emulsion on the film base contains powdered silver salts that are suspended in it. In development, these salts are transformed to metallic silver, the density of this silver being directly dependent on the amount of light that has fallen on it and the length of time it has been allowed to act on the silver salts.

In photography, we use only the light which is reflected from our subject, consequently we must consider the reflective power of our subject and the color of the light that is striking the emulsion.

The more important factors that must be considered in photography are exposures and lighting. Your picture, as it is viewed in black and white, is made up of a variation of tones from black to white; that is, the various degrees of contrast throughout the picture gives us the form and image of the subject in the picture.

Consequently, if we desire a true reproduction of our subject, we must expose the film so that a sufficient amount of contrast in all portions of the scene are comparable to the original.

Only a correct exposure can give all the tones from black to white that are necessary to true reproduction. If film is overexposed, the delicate tones are lost as the overabundance of light destroys them and the detail has been lost.

There is no way of satisfactorily intensifying this type of film, as the developing agents have dissolved the metallic silver, and contrast cannot be increased where detail does not exist.

The underexposure of film is caused by not allowing sufficient light to reach the emulsion. Like overexposure, the detail is again lost, because the reflected light from the details has not been allowed to act upon the emulsion to any effective degree, so that the variation of tones can be produced.

Panchromatic films have a wide range of light sensitivity, and in addition to the improved methods of processing a maximum correction is given to the film to improve any miscalculation of exposure.

Should you overexpose or underexpose your film as much as a full stop the intricate processing machine will correct this error to bring the exposure to its normal stop.

Light is very misleading to the eye, and its effectiveness or actinic value can change in a short time. Seasons, latitudes and hours of the day can affect the actinic value of light, giving a wrong impression of its strength and cause you to make incorrect exposures.

Early morning or evening light may appear bright to the eye, but its photographic value is less than a noon sunlight. Therefore exposures in early morning or evening must be increased to adjust for this lower actinic value.

Light is greatly filtered when the sun is in a low position, causing a predominance of yellow and red rays during these hours. The loss of the ultra-violet rays of light at this time lessens the speed of the film emulsion.

An early morning scene may call for an opening of f.5.6, but at high noon the same scene may require the smaller opening of f.11. We may also film the early morning scene at f.8, but we must operate the camera at slower speed.

If the camera is operating at 12 frames a second, the shutter of the camera remains open longer than when it is operating at 16 frames a second.

This slower speed of the shutter allows the light to act on the emulsion for a longer period of time, increasing its exposure. The only advantage this procedure adds is that the smaller stop of f.8 rather than f.5.6 increases the sharpness of distant objects in the scene.

The light during summer months is approximately two-thirds stronger than winter light. The value of light in June is at its maximum about six hours of the day, but in December its maximum strength is only a period of four hours and then only one-third as intense.

It is therefore very difficult to accurately determine the exposure of a scene when one is confronted by so many conditions that affect light values, and it is strongly recommended that a reliable light meter be used for all outdoor and indoor photography.

Proper exposure depends upon the following conditions, all of which may be calculated with a good exposure meter, but confusing when you depend upon your intuition only.

1. Hour of the day.
2. Geographic latitude of your location.
3. Season of the year.
4. Speed of the film used.
5. Color of the light reflected by the scene.
6. Type of light source (sunlight or artificial light).
7. Speed of the film travel in the camera.
8. Speed of the camera shutter.
9. Size of the lens opening.
10. Brightness of the reflected light.

Photo-electric meters are pointed directly at the subject to be photographed and the opening to be used is calibrated on the dial. It measures the amount of light that is reflected from the subject, which is the same amount that penetrates the camera lens.

In photographing small areas, the exposure is taken from the ground and not the sky. The brilliancy in the sky greatly affects the reading of the meter.

Inasmuch as the sky photographs white, the exposure of the ground area is of greater importance, consequently the meter is tilted down at an angle of approximately thirty degrees to exclude the sky. This practice should be made when photographing with a filter.

Seascapes or views consisting of great expanses of sky and water will appear flat on the screen due to insufficient contrast. The meter will register the correct amount of light for the exposure setting, nevertheless the picture will be improved if you close the diaphragm one stop to increase the contrast of the darker objects and lighter areas of the scene.

If you are using dark foregrounds of arches, trees or dark areas to frame

(Continued on Page 520)

Seltzer and Basil Direct and Photograph for WPA

Elaine Basil and Leo Seltzer, at work on 16mm. productions for use in schools, museums, health centres, hospitals, etc. At present they are making a three-reel 35mm. sound film for the New York Civil Service Commission, which also will be released as a 16mm.

Photo by Sid Friend

PRODUCED by the motion picture production unit of the WPA Federal Art Project Photography Division, "From Hand to Mouth," an educational film on the causes and prevention of bacillary dysentery, had two simultaneous showings at the New York World's Fair when its presentation at the Medicine and Health Building augmented its current release at the fair's New York City Building.

Directed by Leo Seltzer and Elaine Basil and photographed by Mr. Seltzer, supervisor of the Motion Picture Production Unit, "From Hand to Mouth" was sponsored by the Bronx Hospital, where Dr. Joseph Felsen acted as medical and scientific collaborator.

This two-reel film presents a new direction in health education, making available to the general public information pertinent to bacillary dysentery, and showing what medical science is doing for its prevention and what the community at large can do to eradicate its causes.

Didn't Believe in Signs

In traveling around the city with their 50-pound load of motion picture equipment these two young Federal Art Project camera artists found their way into slum district-tenements, and into new low-cost housing developments, into public markets and pushcart stalls, cafeterias and along the water front.

They found a group of youngsters in an East River "swimming hole," splashing about right under a sign which read, "Polluted Waters: DO NOT SWIM."

"In regard to our work," said Mr. Seltzer recently, "most of our productions have been on 16mm., including the film 'From Hand to Mouth.' This is to permit the most widespread utilization of these educational films in schools, museums, health centers, hospitals, etc. The fact that sponsors have in many cases a very limited budget for film production makes it necessary, if the film is to be produced at all, to shoot it on 16mm.

"Miss Basil and I at present are working on a three-reel 35mm. sound film which is being produced for the New York City Civil Service Commission. This film is intended for showing at the New York World's Fair in 1940, in schools, citizens' groups and other interested organizations. It will therefore also be released as a 16mm. as well as a 35mm. film."

Leo Seltzer was born in Montreal, Canada, 29 years ago. His technical training in high school, in college where he took courses leading toward an engineering degree, was supplemented with a number of years in art school.

After two years at college, in 1931 he planned to follow a line of work which combined his two major interests, art and technology. This synthesis, he felt, could be best achieved in photography. However it is not to be inferred that he arrived at his choice of a career in a purely mechanical manner. For as far back as he can remember he owned and used a camera.

Newsreel Is Documentary

His first "real" work came, he says, when he began to make motion pictures as a free lance news cameraman in 1931. He describes this work, which formed his major interest for the next four years, as "social documentary newsreel photography." In this activity he did extensive work as cameraman, director and editor.

In 1932 he took a trip through the Middle West and South with Sidney Howard, the playwright, for the purpose of collecting material for a film on the agricultural workers in these sections of the country. He has made numerous films of this type. One, in 1933, received favorable comment for its manner of dealing with the life and work of longshoremen on the New York waterfront.

His work is characterized by the selection and illustration of pertinent material, as well as a unique point of view. He believes that there is hardly a subject which cannot be presented in an

(Continued on Page 521)

Making Newsreel of Family Thanksgiving

By C. J. HUBBELL

West Coast Manager M-G-M's "News of the Day"

THIS year many of us are going to have two Thanksgiving Days —one the time-honored last Thursday of November, the other a week earlier, set aside by Presidential proclamation. Of course a photographic journal is no place to delve into the political and other controversial aspects of that question: but doubling up on the holiday certainly ought to give the Thanksgiving moviemaker a break.

With two Thanksgiving Days it should be much easier to turn out a really complete film of the family's Thanksgiving celebration—no matter which day you celebrate!

This is one season when the newsreel cameraman and the home-movie filmer have plenty in common. Newsreel crews everywhere count Thanksgiving as an every-year "must" subject, for at that season no newsreel issue is complete without its turkey day story.

In the same way most home-movie addicts find themselves under orders from their better halves to film the big family get-together. Both the newsreeler and the amateur are in the same boat: they've got to make a story from hackneyed material—and make it interesting to disinterested audiences.

If we examine the average material available to either one, we find that both of them have pretty much the same story ingredients to work with; therefore newsreel methods can be beneficially applied to making the home film.

Let's See What's What

Let's examine the basic material. Holiday — big family gathering — food and lots of it (especially turkey!); often the menfolk take in the local football gigantic—and finally that overstuffed feeling, frequently accompanied by distressed tummies.

There's your story in a nutshell. Its basic elements are tried and true; they've been serving newsreel crews faithfully for almost thirty years without growing stale—and if you dress them up in becoming cinematic clothes they'll serve you, too.

What's more, if you give a little thought to continuity and preparation, they'll give you a picture that will not only please the family group, but one that will amuse outsiders, as well.

By way of introduction this year we've a chance to depart from the time-honored formula by stressing the dual holiday angle. Since this magazine is supposed to be politically neutral, I'll leave the how of this treatment up to you and your own political preferences; either way, you'll find plenty of angles on which to work!

Once we're into the picture, why not a little advance flash of the family plans? You can have shots of Mother sending her invitations, and planning her feast—pricing turkeys in the butcher's shop and checking up on the capacity of the family roaster.

Father can be shown studying football schedules and getting the tickets to the big game. The children can be shown preparing in their own way—Johnny, perhaps, in training for record-breaking table performances, big brother Bill training for the game itself.

Ovens Important

All of this brings us to the day itself. Now we have Mother's preparations for the feast. Getting the table set—the pies and pudding prepared—and of course, the turkey entering the oven!

The next sequence can treat the preparations more personally: the family getting spruced up for company. Father's protests at being urged out of his slippers; the boys arguing over the bathroom; the feminine members putting the last touches to make-up and coiffure.

If you have a family—and an observant eye—you can develop abundant natural comedy relief from these suggestions. Simply keep your eyes open during the next few weeks!

And here, the relatives and guests begin to troop in. Since most of us are likely to be busy then, the simplest sort of newsreel treatment is best for this. Show the folks arriving and being greeted; then take a firm grip on the rabbit's foot, and go a-gunning for candid shots.

At any rate, if you want to have an interesting picture, avoid making the conventional "posed" group picture of the family assembled. Individual, candid closeups are better; they are more interesting and far more characteristic.

Then, if the family is football-minded, comes the trip to the big game.

After that, the feast, highlighted by the demolition of the turkey.

By the time this is over, and the diners recover, good-byes are in order; but by that time, too, it is usually too dark for good photography, unless you want to go to the trouble of staged action with lights. And by that time, most of us are too tired—and too full —to be camera-minded.

Much Filming Before

This looks like a huge day's filming, doesn't it? It would be, too—if you had to do it all at once. But the fact of the matter is that a surprising lot of it can be done before and after the actual holiday, and the scenes that must be made then can be made almost painlessly, if you plan them in advance.

All of your introductory scenes can be shot at any convenient time before the holiday. All the business about preparations—doing the marketing, selecting the turkey, getting football tickets, and so on—can of course be done ahead of time.

And a surprising lot of the more detailed shots of getting the dinner under way can be, too, for many housewives like to bake the pies, make the hard-sauce, and even prepare the turkey for roasting the day before, leaving a minimum of work and worry for the big day itself. That of course makes the filming easier; and in addition, many families are likely to celebrate *two* Thanksgiving-days this year, so the opportunities will be doubled!

That goes for the football game sequence, too. Since these games were arranged a year or more ago, when everyone thought that Thanksgiving, 1939, would fall on November 30, they were set for that date—and even though many of us will eat our turkey on November 23, the pigskin will get kicked around on the traditional date. So there's another less sequence to film while we're full of turkey.

And—whisper it softly—if you're hosting a big party to the game, or if you find the crowds are too big (and your seats too bad) to permit good camerawork, you can often double shots of some earlier game—or even last season's game—in your picture.

Around the Radio

Incidentally, if you are one of the economical families who prefer to take their Thanksgiving football in comfort, via radio, you can still get an action-

(Continued on Page 523)

Pacific Labs Have Complete 16mm. Service

(Continued from Page 498)

has sound recording rooms with instruments to record direct on film or acetate discs, sound cameras for synchronous recording and a sound truck for location work.

Its processing department is of the latest design, with air conditioned rooms and with absolute temperature control of developing solutions. The developing machine is a twelve tank unit with removable stainless steel tanks and has a capacity of 20,000 feet per day. The first tank provides a soak bath to eliminate any air bells from the film before it enters the developing solution. Then there are three tanks of developing solution, followed by a short stop tank, one rinse, three of hypo fixing baths, and three fresh water spray baths. The finished product is absolutely free of water marks and there are no roller scratches under the sound tack area.

Here the photographer can ask for definite standards of processing and be assured of that result. Densitometry and sensitometry are employed for testing, and the operator in charge is one of the ablest technicians in the country. Production of sound track, composite printing, duplicating negatives, editing, cutting, etc. are all part of the service.

The producer or advanced amateur requiring such service can find here complete 16mm. equipment and can place the responsibility for all technical work with one establishment.

Agfa Ansco Providing New Greeting Card Equipment

Amateurs planning to make photographic Christmas Cards this season will be glad to know that a new Agfa greeting card outfit is now available which greatly simplifies the work involved in preparing and printing the combination negative.

The new Agfa outfit provides six 5x7-inch masks made on Reprolith film, which carry the design and message of the card. Each mask also has a 2x3-inch rectangle of clear film appropriately located for the printing of a personal snapshot negative.

Guides are privided on each mask to simplify centering of standard 4¼ x 5½-inch greeting card stock, and full instructions are included for use of the masks and for imprinting personal signatures. Special attention has been given to the construction of the masks to insure good contact with the paper and in the design to provide a pleasing relationship between picture area and ornamental decoration.

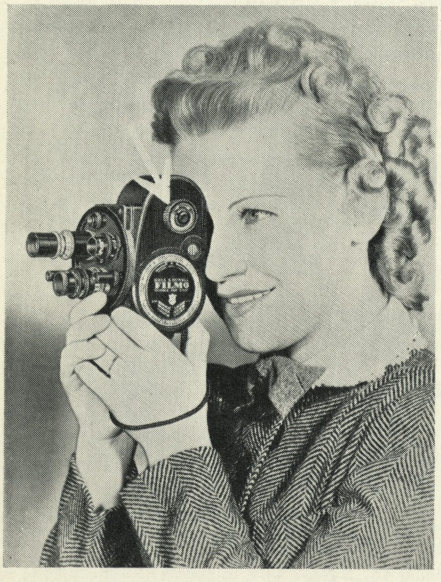
The new Agfa greeting card outfit is available at photographic dealers at $1.69. Special deckled-edge photographic paper in the 4¼ x 5½-inch size of Agfa Cykon Kashmir White has been made available at the regular price of $.45 per two-dozen package, $1.10 per ½ gross, $2 per gross.

Lap Dissolves and Other Effects Available in B&H 8

Lap dissolves and other theater-movie effects which require backwinding of film in the camera can now be made with Filmo 8mm. equipment.

The lap dissolve rewind attachment recently announced by Bell & Howell can be installed on any Filmo double eight camera, either before or after purchase. A unique feature of this new Filmo 8 rewind is that it counts the frames one by one as they are rewound in the camera.

Bell & Howell announces that a special fader to work in connection with the new rewind will soon be made available. In the meantime owners of Filmo 8 cameras provided with the new rewind attachment can improvise means for fading with the lens diaphragm.

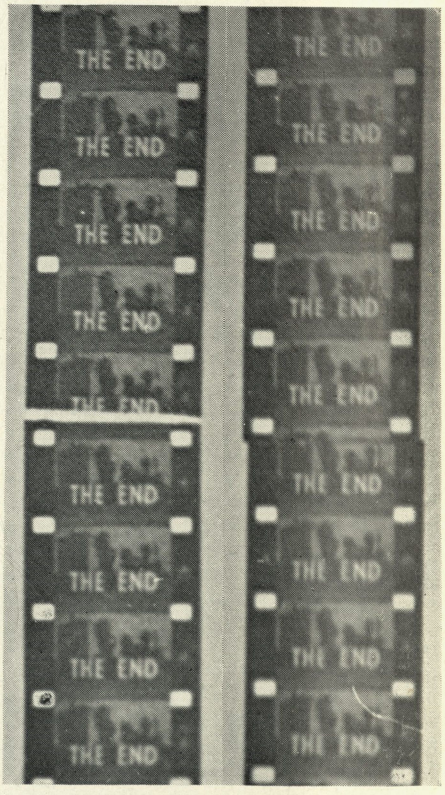


Arrow denotes new lap-dissolve rewind attachment on a Filmo turret 8.

Film-Weld on Market Already and Going to Amateurs Soon

Larry Strong, Inc., 1241 South Wabash avenue, Chicago, is shipping Film-Weld, the successor to Film Cement, to professional users. The company is not quite ready to contact the amateur field, although that plan is already determined. The fluid is for nitrate, acetate and all color film. It is issued in bottles to theatre, exchanges and studios in sizes of 1 ounce, special theatre size of 4 ounces at 50 cents, of a half pint and a pint. Price of the latter is $1.25.

It is not a cement in the ordinary acceptance of that expression. Rather it is clear as water and really flows as freely. It is claimed to make a splice from .0005 to .0010 thinner than any film cement and to make a splice that won't pull apart. It may evaporate, but so slowly that it hardly counts. It will not lose strength when left exposed to air or thicken. It will not harm clothes or fingers or cause film to buckle.



Splices made with a faulty splicer.

See Page 508

Educating 300,000,000 With 16mm. Movies

(Continued from Page 510)

own subjects, we will naturally show many of the educational films already produced in America and Europe. We will of course work with 16mm. silent films, and with each film we will issue a booklet describing the film, so that the projectionist can give any explanation which may be necessary for his particular audience.

Wherever possible we hope to avoid the use of titles, and keep things strictly pictorial and visual.

Educational—But Entertainment

There seems but one serious drawback to this plan. That is that since our audiences must come voluntarily, strictly educational films are likely to be too dull at the outset.

Therefore we plan to sugar-coat the pill. We will begin by producing films of our own which will combine educational value with entertainment.

That is, they will tell an interesting, if simple, story which will at the same time indirectly get over some bits of practical information likely to benefit the audiences that see the film.

There is yet another important aspect to this. By making our own films wherever it seems best, we will be able to apply the desired information more intimately to the lives and understanding of the audiences we try to reach.

An audience of American miners, for instance, would not be nearly so likely to appreciate a film on safety methods if they saw it enacted, let's say, by Turks or Russians, as they would if they saw it enacted by Americans like themselves.

In the same way, an audience of Indian miners, stonecutters, farmers or metal workers will certainly take a lesson in modern methods more quickly to heart if they see it presented in a simple little playlet dealing with people like themselves, in surroundings they can understand, than if it dealt with foreigners, in strange surroundings.

Naturally, too, such films could and would deal more directly with some of the things peculiar to India, and perhaps unknown abroad.

Sees Himself on Screen

What we want to accomplish is to be able to make each member of the audience think, "Why, this person is a man just like me, doing the work I do in the same sort of a village. He did things much the way I do—and see how he got hurt and made his family suffer. And that neighbor of his did things a different day—and see how much happier he is because of it. Maybe I could make things better for myself if *I* tried doing my work that new way!"

The question of educating three hundred million people can be simplified, and in time solved in this way. The beginnings will be small, and will necessarily deal with the simplest things first. But they will build a foundation upon which much can be built as time goes on.

I am confident that all of my countrymen who want to see our country advance will assist in one way or another in starting this enormous task. Great help is also to be expected from the many institutions throughout the world which have already done so much for visual education, and those which have expressed such friendly sentiments toward India and her people.

Ultimately I am sure we will see great results from turning 16mm. movies to the task of helping to teach India's three hundred million.

American motion pictures are meeting with considerably less competition in Peru this year than was the case in 1938, according to a report to the Department of Commerce from American Commercial Attache David M. Clark, Lima.

Mexican-made pictures met with little success in Peru this season, the report said. The quality of American films shown this year was definitely superior to that of 1938 and as a consequence they have produced good income returns.

Densitometry and Its Application

(Continued from Page 513)

use can be calibrated. Sensitometric strips measured on an integrating sphere can be used as sub-standards for this purpose. It is shown that the variation in graininess of the various films will have very little effect upon this. A calibration made using a series of densities on positive film will make it possible to measure all other materials on such a calibrated opal glass densitometer within an error of .02.

These results all point to the final solution of the problem that the density values obtained on various types of densitometers may agree and a basis will be obtained for the calibration of such new types as may be constructed in the future.

July, 1939
West Coast Laboratory
Motion Picture Film Department

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Some Notes on Exposures for Beginners

(Continued from Page 514)

your picture for good composition, these foregrounds will mislead your meter. The darker areas do not affect the light-sensitive plate in the meter and the needle would indicate a larger opening. The background, or sunlit sections of the picture would then be overexposed and the loss of the detail in the background would give unsatisfactory results on the screen.

In states or localities that are snow-covered in winter months other compensations must be made to assure correct exposure. The glare of the snow will cause the meter to indicate a small opening for the lens, whereas the light may be weak and low in actinic value. As winter sunlight is only one-third the intensity of summer sunlight, the opening of the lens must be greater.

If you were to shoot at the opening indicated by the meter, the reading would represent the value of light reflected by the white snow only, and the darker objects would be underexposed. To allow for better exposure, it is safer to open the lens one stop more than the meter indicates.

The camera operates normally at 16 frames a second, but when we film at greater speeds of 24, 32 or 64 frames per second, the film travels through the camera gate faster and receives less exposure per frame. We can let the meter compensate for this variance in film travel and take our readings direct from the meter.

If you are shooting at 16 frames a second with a camera that has a shutter speed rating of 1/40th of a second the shutter rating is changed to 1/80th of a second when the camera operates at 32 frames a second.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of American Cinematographer, published monthly at Los Angeles, Calif., for October 1, 1939.

State of California } ss.
County of Los Angeles, Calif. }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared George Blaisdell, who, having been duly sworn according to law, deposes and says that he is the editor of the American Cinematographer, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor and managing editor are:
Publisher, American Society of Cinematographers, Inc., Los Angeles, Calif.; editor, George Blaisdell, Los Angeles, Calif.; managing editor, George Blaisdell.

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(Signed) GEORGE BLAISDELL, Editor.

Sworn to and subscribed before me this 6th day of October, 1939.

[Seal] JNO. A. ERNST,
Notary Public in and for the County of Los Angeles, State of California.
(My commission expires July 24, 1942.)

The following tables are computed for all cameras which have different shutter speed ratings. Select the rating for your camera and you can determine the shutter speed when you operate your camera at various speeds.

Camera Shutter Speeds

Eastman	1/30 second
Zeiss	1/30 "
Stewart-Warner	1/50 "
Keystone	1/50 "
Bell and Howell	1/40 "
Paillard-Bolex	1/30 "
Emel	1/30 "
Ditmar	1/30 "

Cameras with normal shutter ratings of 1/30 second at 16 frames a second

Frames a second	Shutter Rating
8	1/15
12	1/25
16	1/30
24	1/48
32	1/60
48	1/90
64	1/120

Cameras with normal shutter ratings of 1/40 second at 16 frames a second

Frames a second	Shutter Rating
8	1/20
12	1/30
16	1/40
24	1/60
32	1/80
48	1/120
64	1/160

Cameras with normal shutter ratings of 1/50 second at 16 frames a second

Frames a second	Shutter Rating
8	1/25
12	1/35
16	1/50
24	1/80
32	1/100
48	1/160
64	1/200

Films have a different emulsion speed when used with artificial light. This is due to the fact that artificial light is low in blue ray content, resulting in a lower actinic value. This lower value of light can be compensated by an adjustment of the meter dial. The readings of the meter are taken in the same manner as for outdoor filming, although caution should be taken that no light is shining in the meter.

All lights that are used for back-lighting should be turned off while the reading is taken, as they do not figure in the exposure from the camera's point of view.

For photographers who have not as yet purchased a meter the exposure tables inclosed in the film packages will act as a good guide for exposures. Any slight error that is made in judging the exposure will be corrected in the processing of your film.

Seltzer and Basil 'Direct and Photograph for WPA

(Continued from Page 515)

interesting and dramatic manner through the medium of the film, whether it be a documentation of a news event or an illustration of a highly technical industrial process.

Films Plane Engines

He made an educational film, in 1935, dealing with the manufacture of aeroplane engines in the Wright Aeronautical plant. This film was subsequently used to teach other workers in this highly specialized industry.

During this same year he also produced a series of medical films in natural color at Mt. Sinai Hospital. One of these educational moton pictures filmed an experiment in bloodless surgery. Another dealt with surgical procedure in lung operations.

Since his employment by the WPA Federal Art Project in New York City, Seltzer has photographed and directed a film on the "Technique of Fresco Painting," which demonstrates the entire process of planning and painting a mural in fresco.

Copies of this film have been allocated by the Federal Art Project to a number of museums throughout the country and have been seen with great interest by audiences in schools, colleges, and cultural groups in hospital, orphanages, clubs, unions and other organizations and institutions.

The completion of this film saw the establishment under the Photography Division of the WPA Federal Art Project of an official Motion Picture Production unit, headed by Leo Seltzer. With additional facilities and personnel, a definite program of production of sponsored educational films was started.

Both he and Miss Basil recently have been engaged in working on a film for the New York Civil Service Commission, picturing the fight for good government in the City of New York and the functions and aims of the city's civil service merit system.

Only Camera Owner

Miss Basil grew up and went to school in Detroit. Her childhood interest in the theater led her to New York, where she won an acting scholarship for the Theater Guild School. But her idea of theater was repertory, where within a group all phases of the theater could be experienced and a continuity of development assured.

Because of her belief in community group theater activity she worked in and helped develop the Studio Players, in Cambridge, Mass., and later the Actors' Repertory Theater in Atlantic City.

When the Atlantic City group needed photographs to illustrate the work and the plays being presented, Miss Basil was assigned to take these pictures, for the reason that she was the only person available in the group who owned a camera.

Watched Film Production

With the success of that photographic experience still fresh, she returned to New York, and, finding no opening in the theater, she gladly accepted a job to do camera research for Albert Johnson, who was designing sets for a Paramount motion picture.

She photographed typical buildings and locations in New York characteristic of certain periods, which could be used as source material for Mr. Johnson's work. She also had many opportunities to watch film production on the set.

Her association with an independent film production group as still photographer in the making of a film on the New York waterfront brought the realization of the dynamic possibilities of the motion picture to record and present in dramatic continuity the life that existed all around her.

From this idea she became seriously concerned with film production. And although her plans were plentiful and she had many ideas, there were no funds for films and equipment.

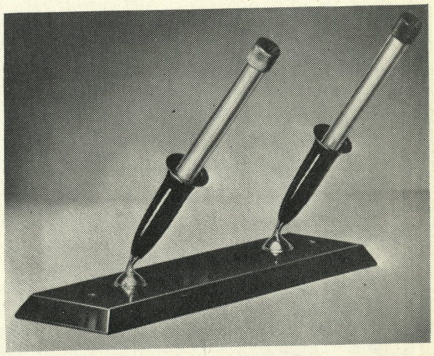
Employment by the Federal Art Project Photograph Division solved this problem somewhat, and when she later was assigned to work with the motion picture production unit she was permitted activity in film on the "Technique of Fresco Painting," but her first real opportunity to handle a movie camera came when she was assigned to do a short film on the problems of the Out of School Youth.

Her work on "From Hand to Mouth" covered almost every phase of its production, from preliminary research in collaboration with Mr. Seltzer to writing of the script and codirecting.

Besbee Products Company Has Unique Splice Gadget

Besbee Products Corporation in Trenton, N. J., has brought out an unusually clever and useful article for rapid and efficient splicing called the Rapid Twin Desk Set.

The Rapidon Film Adhesive Applicator, which does away with gummy cement brush and bottle, and his twin brother, Rapidoff, the handy Emulsion Moistener and Remover (works like a fountain pen), are placed in an attractive metal holder.



This is not a desk pen—it is a splicing aid

When on a desk the complete unit resembles an expensive fountain pen desk set. Besbees price for the set is $3.50. See it at your dealer's or write direct to Besbee.

CLEAVES VISITS FORD'S: NOW NEGATIVE NO. K-42

ALL famous guests—not excepting photographers—get photographed at the Ford Exposition at the New York World's Fair. Howard Cleaves, ace wildlife photographer who made a diving suit for his camera and has traveled more than 50,000 miles to bring wild animals back on film, spent fifteen minutes in the photographic department of the big exhibit—and walked out with a glossy print of himself.

Daring, patience, and mechanical ingenuity have marked Cleaves' unique career. He has been photographing animals all his life. He descended in a water-tight tank to film diving ducks in action. He cruised 250 miles over the Florida Everglades in a blimp to photograph wildlife below.

He has crouched night after night for more than a week in a steel barrel on the edge of a forest clearing to record flash light pictures of wild bears. It took him three years to get one of his most famous pictures, of an osprey rising from a strike.

In the Ford Exposition's photographic department files, Cleaves became Negative No. K-42. The photograph of him which accompanies this article was one of more than 100,000 which have been made under the shadow of the Trylon and Perisphere, and mailed for publication during the 1939 World's Fair season.

Six photographers, headed by Russell Kimble, constitute the department personnel. This department is just one unit of the vast photographic division of the Ford Motor Company, headed by George Ebling. A newspaper photographer of distinction himself, Kimble broke in on the Philadelphia Inquirer in 1921.

He has been staff photographer for the Chicago Tribune, Detroit Free Press, Detroit News and Washington Post. He knows a headline picture when he sees one. He made the capture of Banjamin Purnell ("King Ben") of the House of David at Benton Harbor, Mich., in November, 1926. He has covered the White House and all official Washington.

He was the second newsphotographer in the Clark Street garage where in the Valentine's Day Massacre took place in Chicago on February 14, 1929. He hails from Wilkes Barre, Pennsylvania. He covered the Century of Progress in Chicago, 1934, and the California Pacific International Exposition in San Diego, 1935, for the Ford Motor Company.

Equipment in the Ford Exposition's photographic department, which has done the biggest job of any industrial building at the Fair, is standard. Included are two Eastman 5 by 7 enlargers, one Pako contact printer, three speed Graphics, and one all-metal 8 by 10.

When King George and Queen Elizabeth visited the World's Fair—Kimble made them, of course. He wired Dearborn for a "Big Bertha," and snapped the royal couple from the roof of the Ford Exposition as they whizzed past, enroute to their reception at the Fair.

To show you how they do things at the Ford Exposition at the New York World's Fair—here's Ace Wildlife Photographer Howard Cleaves. He poked into the film developing room, and as he took a peek at a negative, he too was photographed.

Eastman Issues Silent 16mm. Films by Teaching Division

The following new 16mm. silent films are announced by the Teaching Films Division of the Eastman Kodak Company, Rochester. The prices quoted cover outright purchase, which in each case is $24.

The Eyes (Advanced)—Animation and photography show, in detail, the anatomy of the eye; dissection of an animal's eye, microscopic structure of the retina—physiology of the eye; correct use of lenses to overcome defects in focusing—hygiene of the eye.

The Eyes (Primary)—A film intended for use in elementary grades. Compares the eye with a camera, shows the action of the iris; focusing; pathway of light impulses to the brain. Care of the eye.

Child Care, Bathing the Infant—Various types of equipment which may be employed in bathing the baby are shown in use, as well as the correct methods of handling the infant during the bathing operation.

Child Care, Feeding the Infant—A detailed picturization of the routine of feeding the breast-fed and bottle-fed baby. The preparation of utensils used, the procedure of making up the feeding formula, and the feeding operations are shown.

Food Series, Vitamin B_1—the natural sources of vitamin B_1, the antineuritic vitamin. The effect of deficiency of vitamin B_1 on pigeons and young rats. The effect of extreme vitamin B_1 deficiency on human beings—beriberi.

Safety Series, Safety at Home—This safety film for children in the first three grades illustrates safety practices for children in the home.

Safety Series, Safety at Play—A safety film for children in the first three grades. Contrasts safe and unsafe places to play.

Safety Series, Vacation Safety—A safety film for use in grades four to six, and in Junior High Schools.

Making Newsreel of Family Thanksgiving

(Continued from Page 516)

filled football sequence into your film. Just get a succession of close shots of your menfolk clustered excitedly around the radio — closeups of supporters of the opposing teams registering joy, sorrow, disgust, etc.

When the roll comes back from the laboratory intersperse these scenes with your stock shots of other games—and you'll get a convincing effect, particularly if you work in some fotofade "wipes" from the radio shots to the game shots.

All of this leaves you just about three sequences to shoot while the celebration is actually on: the arrival of the guests; the emergence of the turkey from the oven; and the actual feast, including, if possible a closeup of the ruins of the turkey when everyone has had enough.

The shots of the turkey entering and leaving the oven can be quick closeups, and can be safely made without benefit of a tripod. Even if you are working in color, a single lamp should suffice. If you can, get one of those clamp-on lamps equipped with a "mogul" base, and use a No. 4 Photoflood.

That gives a lot of light, and will enable you to cover a much larger area with only the one light, making for faster work.

Now, the simplest way to handle the shots of the arriving relatives is to set the camera on its tripod on the front porch. Then, with the camera prefocused and wound, all that is necessary is to start it running as each group of guests arrives, and let the actual event "direct" itself.

With many cameras, you can even let the camera run itself while you walk into the picture and play your own part!

Plenty Lights in Advance

For the scenes of the dinner, it is a good idea to set up your lights ahead of time, and if possible have enough of them so that you can use several separate groups as a unit.

This way, when you see something interesting happening at one end of the table, all you need to do is throw one switch, or, if you have each group connected as a unit to a multiple outlet, plug in one connection. Then the lamps illuminating that particular area will come on, and you can shoot your scene quickly, without disturbing your people too much—and get back to your own plate with a minimum of delay.

When something interesting happens at another part of the table, it can be filmed the same way, without moving lamps and sometimes without moving the camera. A variety of angles helps build the effect of such a sequence; so, too, does the use of a variety of lenses, telephoto, normal and wide-angle.

And to close your picture, it's hard to improve on the trusty old newsreel "gag"—the aftermath: "Junior," deeply regretting his last few pieces of pie, gulping down a spoonful of castor oil!

It may not be altogether novel, but it is certainly human interest; we've all done it.

And human interest and continuity are the factors that make a family's holiday film interesting to the other fellow!

Philadelphia Cinema Club

In spite of the hottest day ever recorded in Philadelphia, for October 10, the Philadelphia Cinema Club entertained a rather large group at its October meeting held in the Hotel Adelphia.

Our own W. W. Chambers, whose reputation as a photographer goes back a considerable number of years, exhibited to the membership 800 feet of 16mm. black and white scenes entitled "The Delaware Canal and Vicinity." He then showed 400 feet of Kodachrome of scenes in and around New Hope, Penn.

The showing was accompanied by comments from Mr. Chambers on the scenes with reference to lighting, composition and specific attention to details. He demonstrated clearly that he is a master of the movie camera, as well as of still photography. He particularly emphasized certain features of lighting by running portions of the film backward, as well as forward. This was particularly true of back-lighted trees.

Not to be outdone, W. E. Chambers, bringing in a Bolex projector, adjustable to both 16 and 8mm. film, presented his offering of some 800 feet of 8mm. Kodachrome taken at the World's Fair. He demonstrated that by bringing certain shots down to 4 frames of speed, he was able to get results not otherwise possible. Mr. Chambers, then speaking on the topic he knows so well, discussed for the members the legal aspects of photography.

The average amateur gives practically no thought or consideration to his possible legal obligations when photographing living subjects, and the frank discussion was certainly a welcome addition to our knowledge on that subject.

He also demonstrated quite clearly with his World's Fair pictures that a lawyer can at the same time, be a good camera man.

Using a Polar Screen, varying his speeds, taking shots indoors and out, making use of sky, background and the masses of color, he used the fair to produce a real 8mm. job.

B. N. LEVENE,
Chairman of Publications Committee.

Notes on Exposure Meters

(Continued from Page 501)

light and where the darkest significant shadow. Next determining the proper distance to stand from each when making the reading. This is a serious problem as has been shown in the discussion of Figure 4.

Next comes the problem of determining the geometric mean (not the arithmetic mean) of the two readings. When all these steps have been taken a significant figure is obtained which will usually lead to the determination of a correct exposure. However this is not a method which can be used in a great hurry.

In this discussion several of the more important conditions which affect the readings obtained from a photoelectric exposure meter have been pointed out. Next month it is proposed to present a quantitative analysis of the functioning of a meter set up on a test stand in a laboratory.

This procedure will enable us to form an idea of the magnitude of the variations that may be expected.

(TO BE CONTINUED)

Figure 4

R. Fawn Mitchell Manager of Precision Laboratories

The rapidly expanding technical facilities of the Berndt-Maurer Corporation have been increased by the addition to the staff of R. Fawn Mitchell, who has been installed as manager of Precision Film Laboratories. Precision is a wholly owned subsidiary of The Berndt-Maurer Corporation.

In his new capacity he will bring to the present and prospective clients of the laboratory the benefit of his wide technical experience. Previously, Mitchell was manager of Andre Debrie Inc. of New York for two years and before that for twelve and a half years head of the technical service of Bell & Howell in Chicago.

He has also been active in the activities of the Society of Motion Picture Engineers, particularly in those of non-theatrical and laboratory committees and is the author of many technical writings dealing largely with the specialized problems of the 16mm. field.

Pioneer Anthony Fernandez Greets Hollywood Friends

Anthony Fernandez of Mexico City is in Hollywood for a onceover. It is seven years since he has been in this town, in which place he joined the Thomas H. Ince crew in 1911 as a stillman. He admitted the still facilities were not exactly ample in those days, being confined partly to a few trays for developers, etc. After an apprenticeship as a stillman he joined the laboratory, from which he was graduated to the moving picture camera in 1926.

In 1932 he removed to Mexico City as a freelance camera man, specializing in trick shots. He expects shortly there will be a picture shown in Hollywood on which he worked as cameraman, "Ombres del Aire," translated as "Men of the Air." It was made in Mexico.

ART REEVES IN MEXICO LOOKS OVER FILM WORKS

ART REEVES, who for ten years has been dealing in motion picture equipment, is home from a three weeks' stay in Mexico City. He would have stayed a little longer had he been tipped off to the extreme heat that had got more than fairly under way in this Los Angeles town after he got started.

As it was he got in in time for a couple days of 100 degrees or more as it was every day for a week. It did go to 107.2 one day—we are speaking officially now, of course—being but 1.8 shy of an all-time record. Can you beat such luck, after having gone so far, and that 109 having been recorded forty-seven years ago!

Reeves went south with a half dozen men from Mexico City, who had been giving the o. o. to Hollywood and North Hollywood and Culver City and the various other places which are called Hollywood when speaking generally. They were:

B. J. Kroger, who calls himself just a sound man but who bulks big as a Mexico City producer; Gabriel Figueroa, cameraman; George Fernandez, set designer; Lauren Draper, cameraman; Ignacio Torres, still cameraman, and J. Martel, assistant cameraman.

Made Big Ones

Kroger came here mainly to pick up an Art Reeves rerecording system to complete his two sound trucks with Art Reeves equipment. He has made all the big special talking pictures, such as "Alla en el Rancho Grande," "Ora Ponciano," "Ojos Tapatios" and "Que Idiotas Son Los Hombres." His latest pictures are "Papacito Lindo" and "La Noche de los Mayas," the latter with a budget of a quarter million pesos.

The C.L.A.S.A. Studio has several stages and a machine shop. Also there is a laboratory with a Sensitester and two Art Reeves developing machines. Last year these machines processed ten million feet of film.

Garcia Moreno controls the Azteca Studio, with Reeves developing machine and Sensitester. There are two sound stages and laboratory. At the studio of Mexican Films George Stahl has three sound stages. Three other stages are scattered about the city.

The Rodriguez Brothers have three sound trucks. One of these trucks, by the way, is operated by Consuelo, a sister of the brothers. She has a name in the local trade for her efficiency, attested in no uncertain way by the offers, some quite bold and others with one eye on the brothers, seeking to secure her consent to joining one of the competitors.

Makes Fast Trip

Mexico City has twelve sound trucks. Reeves said he had to report his equipment and parts may not have been quite unanimous, but his glow tubes very nearly hit that mark.

The run of the two autos from Hollywood to Mexico City was a trip. The way was through El Paso and Laredo. The party left at 9:30 Saturday night. El Paso was reached at 4 o'clock Sunday afternoon. The bunch slept until 3 o'clock Monday morning. At 4:30 that afternoon they crossed the river at Laredo and started for Mexico City.

The party drove all Monday night. They arrived at Valles for breakfast 5 o'clock Tuesday morning. Then they started up the mountains for the last 200 miles. The elevation of seven to eight thousand feet brought them into the clouds and most beautiful scenery.

It was a wide road, paved with asphalt all the way, with a center line clearly painted. The highway was banked at turns, with many otherwise bad curves protected by steel guard rails.

The writer took the liberty of calling the Southern Pacific office to inquire as to the railway distance from Los Angeles to Mexico City. The answer returned was, that by way of San Antonio and Laredo, it was 2393 miles. As it's eight miles farther from Hollywood than Los Angeles that makes it 2401 miles from here to there, not a bad run from Saturday evening to Tuesday forenoon.

And of course a matter of real interest locally is the statement of the returned traveler regarding average temperature in Mexico City: that it hovers between 65 and 75. It is not easily forgotten we do things—at times—quite differently here, meaning Southern California in general and Los Angeles in particular, where under circumstances somewhat timidly described as unusual the temperature is not content to hover. It really soars. G. B.

THE Railroad Boosters of Los Angeles, a body of young men particularly interested in railroads, boarded a train at Los Angeles the morning of Sunday, October 15, en route to Carriso Gorge, California, close to the border of Mexico. Just to show the members were not of a single track mind, practically every one was carrying a camera.

There were little ones other than minicams and there were big ones. Not many movies were in the bunch, but there were enough to prove the rule. The train stopped at San Diego, where members and guests came aboard to swell the total to 250.

The special train swung over the tracks of the San Diego and Arizona Eastern, which for forty-eight miles out of San Diego is laid in Mexico. The train traveled through the Gorge and stopped for a wait of twenty or more minutes. Much film was consumed, the majority in still stock.

The run below San Diego was spectacular, and while the elevation attained was only 3660 feet the scenery was well worth while. Particularly was this true from Jacumba Springs for eleven miles to the Gorge. The comparatively short bit of track which runs through the Gorge is reported to have cost four million dollars; it is entirely understandable. Also it is equally understandable why an inspector of highway on a speeder looking things over travels over the track ten minutes in advance of a train. The track is about a thousand feet above the bottom of the Gorge.

The start was at 7:30 in the morning. The train reached Los Angeles at 11:20 that evening. That was quite a full day —and the boys and girls seemed to enjoy it to the full.

Making Modern Matte-Shots

(Continued from Page 495)

sults depend upon perfect matching of the two components—which can only be assured by actual photographic tests.

The matte-painting itself is mounted on a special carrier, hung from a rigid, overhead support. The carrier may be manipulated from the camera position, by remote control, moving in and out with relation to the lens, up or down, to right or left, or revolved, to assure perfect registration.

One of these installations fronts on a large door which opens through to the special-effects stage. When necessary, this door may be opened to permit the camera to photograph through clear areas in the painting—which in this case would be painted on glass—to allow the inclusion in the composite shot of any additionally desired action, as for instance on a process screen, a miniature, or even live action, with or without a set.

This has been useful, for instance, in such scenes as a painting of a city street, in which actors at the far end of the large stage have moved in the "distance" of a city street which in actuality was painted.

Use Front Mattes

As has, I believe, been the case in most studios, we have found that the best results come from having a soft matte-line on both the original take of the live action and the later take of the painting. Therefore Retlefsen makes his painting with a soft matte-line.

The areas embraced by the first exposure are in this painting matted out in a flat, non-reflective black. In theory, this should be enough, but in practice we have found that a soft front-matte used in photographing the painting will give an even better blend.

It is more trouble, it is true, but the results justify it. It is greatly to the credit of Cameramen John Crouse, who photographs most of our matte-paintings, that he voluntarily goes to this additional trouble to assure better results.

The teamwork evidenced between Crouse and Detlefsen is notable, too. Each has full confidence in the ability of the other: Crouse is unwilling to ask for a repaint in any detail of a painting until he has exhausted every photographic artifice in coordinating the composite result, for he knows that even minor changes in a well-made matte-painting can detract from its convincing aspect.

Detlefsen, on his part, never argues when he learns Crouse feels the painting needs changes, for he knows that Crouse never demands changes merely to make his own work easier. The result is that when the two complete a matte-shot, very little criticism is ever possible.

(To Be Concluded)

Filmack Extends to 16mm. Facilities Enjoyed by 35mm.

The Filmack Trailer Company of Chicago, national institution in the 35mm. title and announcement trailer business, has just entered the 16mm. non-theatrical field under the name of Filmack Laboratories. It is now prepared to give 16mm. users and road show men the very same trailers that have been furnished to the 35mm. field.

Eastman Prices to be Constant if Possible

THE following notice by the Eastman Kodak Company to its dealers is contained in the current number of a company publication for the trade:

"During the period of 1914 to 1918 the price level of Eastman Kodak products in the United States was kept practically constant. During the present war crisis the Eastman Kodak Company will again use every effort to follow a similar policy, making changes in prices only when increases in costs make it absolutely necessary."

AT last it has fallen our way to look in on the famed production "Good-bye, Mr. Chips." Well was it worth the waiting and the delays. But already there is planning to catch it again before it is lifted from the screen—for it is one of the few pictures that easily will justify a second and a third showing.

Frequently it happens there is an outstanding part in the subject that is being reviewed. Far less than frequently is there a second lead, a co-lead, that shines with marked brilliance. It is the fact here. Robert Donat we know, and as we know him we may be pleased and thrilled at his performance, but we are not surprised.

Greer Garson we did not know. But her appearance on the screen was a continuing thrill—and like her appearance in the book was all too short.

And the cast as a whole was of unusual calibre.

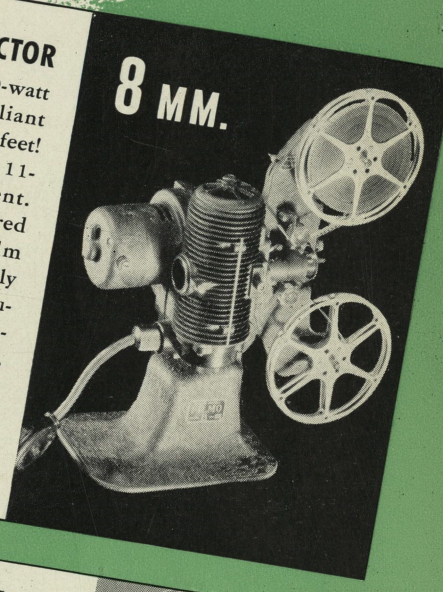
Avoid This Embarrassment . . .

GET A DEPENDABLE *Filmo* PROJECTOR

ITH a Filmo Projector, program interruptions are infrequent and brief. Most models are now *completely gear-driven,* and on the few els which *do* use spring belts to drive reel spindles, belts are kly replaced by anyone, without taking the projector apart. In oving a burnt-out lamp, the cool base rather than the hot glass is ped. Replacement is made quickly, without using tools or gloves. et a Filmo and enjoy that grand feeling of owning a truly fine pro- or which won't let you down when you're playing the perfect host- wman. Get it now, while prices are still low. May we send details? uilt by the makers of Hollywood professional equipment—Bell & well Company, Chicago; New York; Hollywood; London. *Est.* 1907.

FILMO 8 PROJECTOR

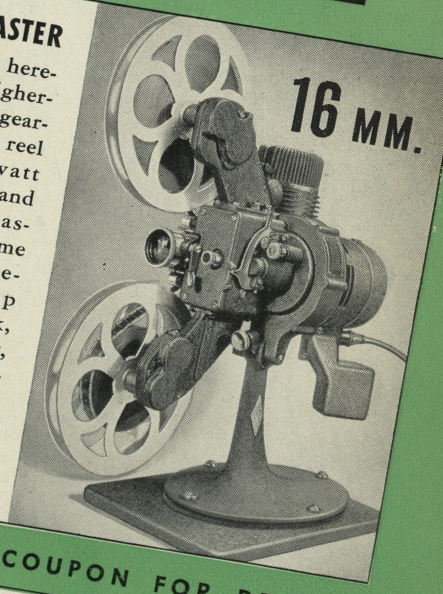
Provides 400- or 500-watt illumination for brilliant pictures as wide as six feet! Flicker is banished by 11-to-1 shutter movement. Rock-steadiness is assured by camera-matched film registration system. Fully gear-driven. Has rectangular shuttle-tooth action, recessed film handling parts, and other features to give complete film protection. Capacity, 200 feet. With case.....$118



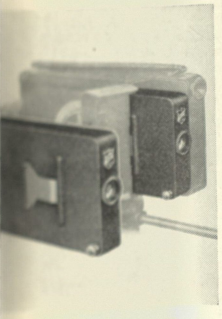
NEW FILMO-MASTER

Has de luxe features heretofore found only in higher-priced Filmos. Is fully gear-driven, even to the reel spindles. Its 750-watt lamp, fast F 1.6 lens, and Magnilite condenser assure brighter 16 mm. home movies. Has power rewind, separate lamp switch, lens focus lock, pilot light, two-way tilt, and other features. Capacity, 400 feet. Complete with case, only.....$139

Other 16 mm. silent Filmos to $412.50



NEW FILMO ACCESSORIES



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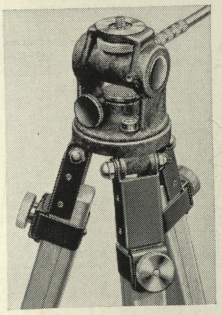

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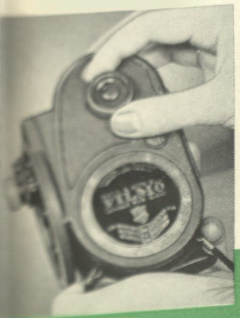

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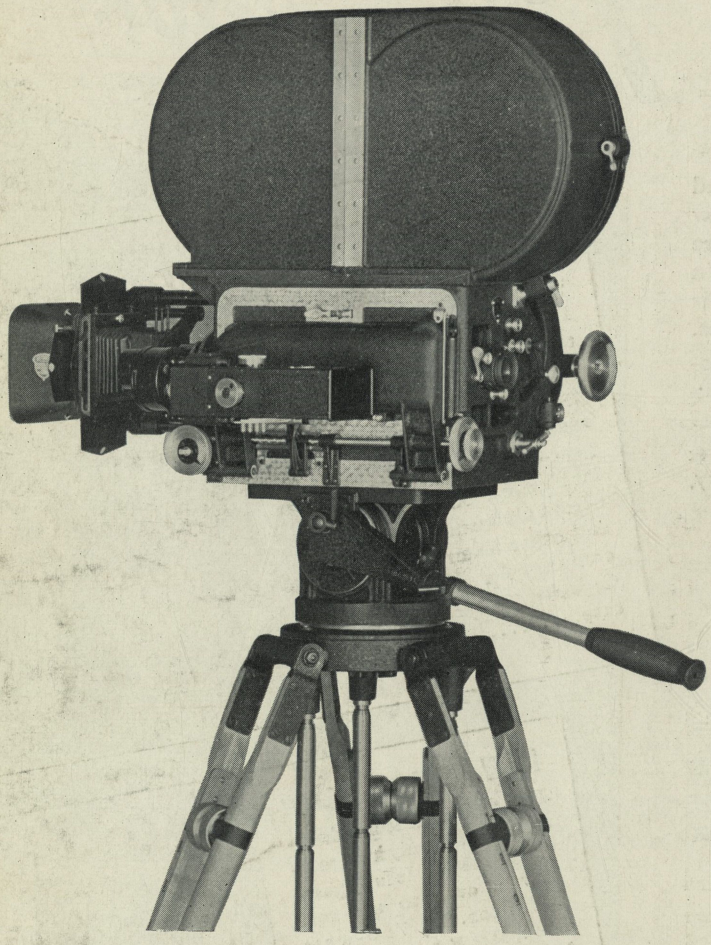

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